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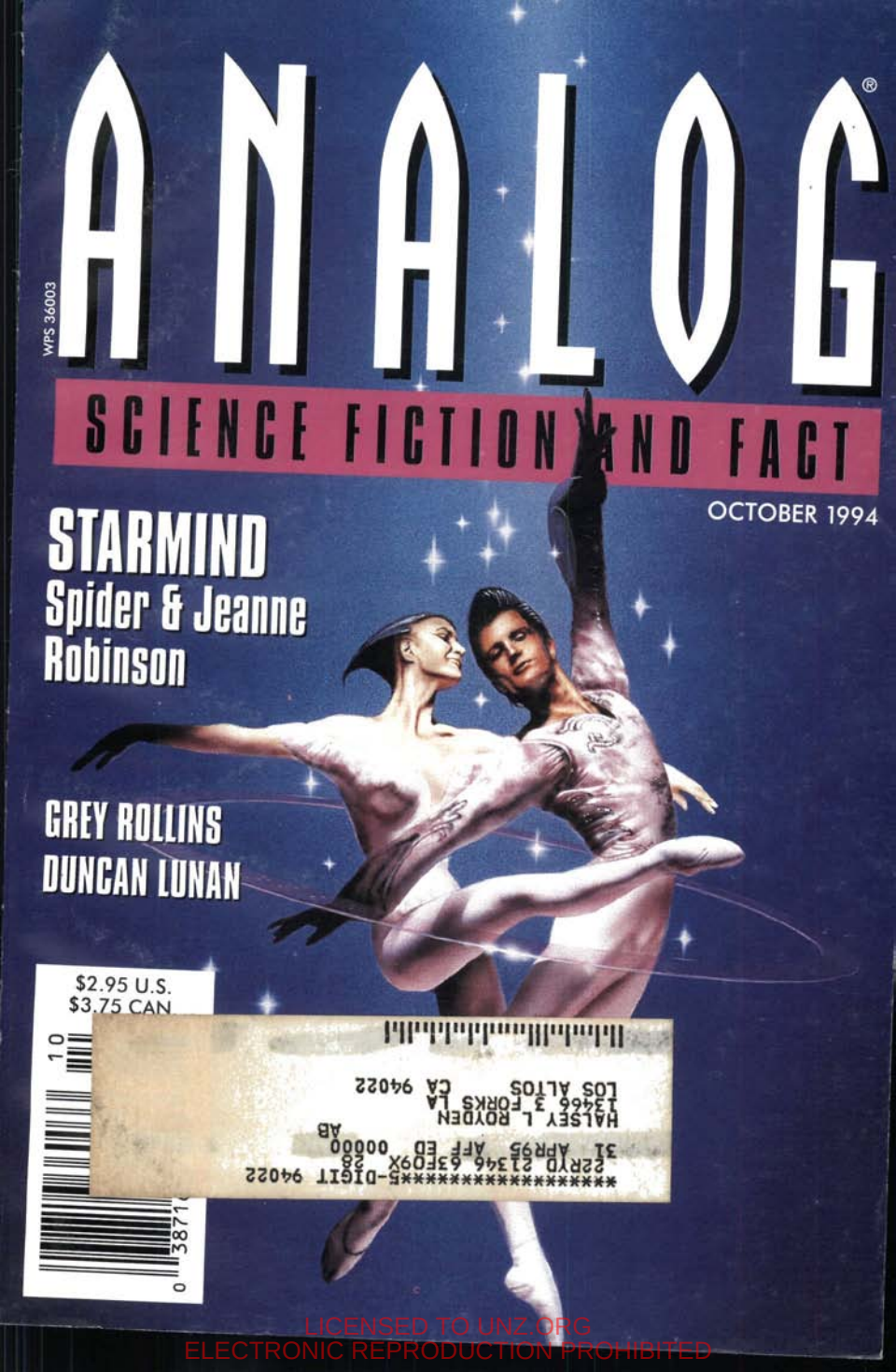

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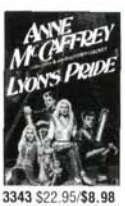

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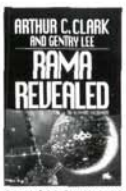

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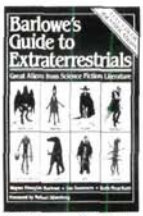

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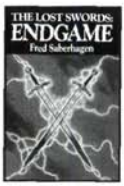

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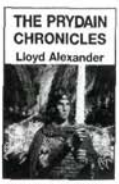

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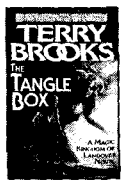

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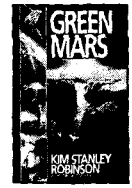

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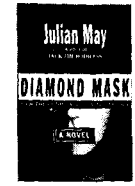

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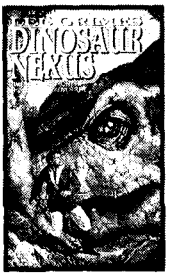

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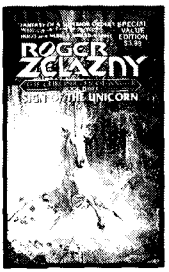

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EDITORIAL Stanley Schmidt

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Question: What's the best way to protect endangered *species?*

Answer: The way that *works* best—which may or may not be the way that *sounds* best.

I recently spent some time camping at several sites in Tanzania and Kenya, which gave me a chance to see firsthand some of the problems of wildlife management in Africa. It also gave me the chance to talk with some of the people who deal personally with those problems: camp managers and guides, national park rangers, and an ecologist named A. V. Milewski who's been taking a hard look at the big picture of life on the Serengeti Plain.

Local appearances can, of course, be deceiving. In a place like the Serengeti, or the Ngorongoro Crater, a casual visitor might find it hard to believe that a wildlife protection problem even exists in Africa. The sheer abundance and variety of life in those places is so mind-boggingly high that it may not seem quite *real* to someone accustomed to the relatively *sparse fauna of most other places. On* the Serengeti or Ngorongoro it's quite possible to drive a Land Rover at a good clip for half an hour while continually surrounded by wildebeest and zebra for as far as you can see in all directions. You can spend all day driving around with only a few brief periods when you *don't* have several large animals in sight.

But the Serengeti and Ngorongoro are very special places, and there are only a few of them left. Outside those few sanctuaries, the creatures which constitute so much of Africa's flavor and mystique are gone, or at least severely reduced and in danger of being lost completely. They've been crowded out by some of the fastest-growing *human* populations in the world. Some have been hunted to near-extinction, either for food or in real or fancied self-defense. Others have simply lost suitable places to live, as their habitats have been ap-

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propriated and converted to grazing range or cropland.

The problems of populations growing that fast are an enormous subject which I've written about on several other occasions, and it's not my subject today. Today my focus is narrower: the fact that even in designated wildlife sanctuaries, despite superficial appearances, many animals are in trouble. The preserves I've mentioned have, for example, vast numbers of wildebeest, smaller but still impressive numbers of several other species—but very few rhinoceros.

Africa used to have two species of rhinoceros, inaptly called "white" and "black." Each used to range over a wide area; each is now limited to a few small enclaves where a handful of individuals survive precariously, thanks to protection by park officials. In a safari during which I saw hundreds of thousands of wildebeest and several dozen elephants, I saw maybe three black rhinos, and those only in the Ngorongoro Crater. And the black is considered the *least* endangered of the five surviving rhino species on this planet.

The general problem with protecting animals in parks is that merely *saying* that they can't be hunted does not mean that they *won't* be. They are; poachers are a perennial thorn in the side of park administrators and rangers all over Africa. Some administrations have felt obliged to get very serious in their dealings with poachers. In the northern Serengeti, when I was there, every critter-watching vehicle had to carry an armed ranger—partly to protect "legitimate" visitors from poachers who might become dangerous if caught in the act, and partly because this practice provided a way to get more rangers into the field at less cost to the administering agency. I never had occasion to see how far our rangers were prepared to go in dealing with poachers they caught, but I have heard that in some areas they're authorized to shoot to kill.

Even with economy measures to increase the number of rangers on patrol, and letting it be known that poaching involves very serious risks up to and including execution on the spot, attempts to eliminate poaching are generally not very successful. There's a *lot* of territory to watch, limited funds and manpower to do the watching, and strong incentives to try to get away with poaching.

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Some poachers are "small-time": local people so deep in poverty that even one gazelle or impala would do wonders for their standard of living. Probably even the enforcers feel a certain amount of sympathy for those. Others are rich foreigners with that archaic mindset that compels them to show everybody how powerful and brave and "macho" they are by killing something bigger than themselves for a trophy. (Never mind how unsportingly *easy* that is in many cases, particularly in preserves where animals have become used to having people around!)

Rhinos are especially problematical, because in addition to the reasons poachers go after other species, they offer a special temptation. Several oriental folklores have long been firmly convinced that powdered rhino horn is uniquely valuable for several medicinal uses (of which its alleged aphrodisiac powers are only the most widely publicized in the West). There doesn't seem to be any scientific evidence that it actually *has* such properties; and even if it did, rhino horn is essentially the same material as human fingernails, so those should work just as well. Scientific arguments are unlikely to dispel strongly rooted folk beliefs, at least on any short time scale, so the market for high-priced rhino horn is not likely to go away any time soon. So if we *really* want to protect rhinos, we need a different way to satisfy the demand for their horns.

One possibility might be to *farm* rhinos, but they're not exactly ideal

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farm animals. It's hard enough just to maintain small numbers of them in zoos. Another possibility might be to have the rangers themselves periodically tranquilize wild rhinos and remove their horns. The hornless rhinos would then be unattractive targets for poachers, and the horns could be sold without the animals themselves being killed.

That would, of course, leave most of the wild population in a more or less permanently mutilated state. Completely aside from the intrinsic ethics of that, I don't think anybody's sure how going about hornless would affect the rhinos' viability. (Is anybody sure what function(s) the horns serve?) Besides, between "horncuts" the rhinos would still have *some* salable commodity on their noses, so they might still be attractive enough to poachers to cost them their lives. So such a strategy might fail to achieve its original aim, and might have adverse side effects, too.

How about making *synthetic* rhino horn? That has the same problem as trying to sell fingernails as a substitute: the people who buy this stuff simply wouldn't accept it as "the real thing." Never mind that it's chemically indistinguishable; these customers aren't buying chemistry, they're buying *mystique*. If you doubt that, or think it marks them as "primitive," look at the number of people in *our* culture who insist on "natural" rather than "artificial" or "synthetic" vitamins. Vitamin C is ascorbic acid whether it comes from a plant that grows or a plant that's built—but plenty of otherwise intelligent people deliberately pay three or four times the price to be sure they're getting the former.

So when it comes to rhino horn, we shouldn't be surprised that the customers would rather buy The Real Thing from poachers than indistinguishable substitutes that could be made without endangering rhinos. Yet synthetic substitutes could be by far the "cleanest" way of supplying what the customers want—if the customers could be persuaded to accept them.

Or, in such a case, might it be morally defensible to *trick* them into accepting the substitute? Whether we believe the rhino horn has the medicinal properties attributed to it or not, the customers do. If we can make the same stuff, in a form indistinguishable from the "natural," and deliver it to them in the form they expect, without their knowing exactly where it came from, might not *everybody* be satisfied?

It's a somewhat uncomfortable suggestion, because in general Truth in Advertising is a good thing, and deviations from it are dangerous. But when the survival of species is at stake, I can well imagine people deciding that extraordinary measures are justified. I can imagine, for example, a roundabout, but potentially effective, conspiracy in which chemists surreptitiously wholesale synthetic rhino horn to known poachers, so they can pass it off to their established clientele as The Real Thing!

Meanwhile, how about the more general problem of hunting as it applies to other species without the

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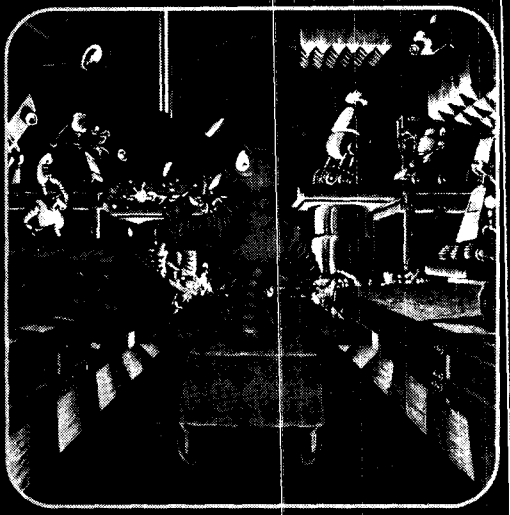

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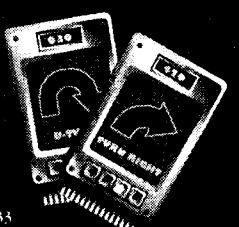

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rhinos' special problems? In particular, how about the Great-White-Hunter, Trophy-on-Wall, Photo-with-Foot-on-Lion syndrome? Here, too, getting people to accept a substitute may be the ticket—but in this case it may be easier to sell in an "aboveboard" form.

One of my traveling companions on last winter's safari was Dr. Joseph Ransohoff, a neurosurgeon who used to do a lot of big game fishing. In response to the realization that species like tuna and sharks were being seriously overfished, Joe pointed out, most big game fishing tournaments are now operated on a "catch and release" basis. Fishermen who want to show off The Big One That Didn't Get Away can still do so, via photographic trophies; but the big fish get to go on being big fish and making little fish. Joe came up with what just may be one of the more constructive ideas for stamping out the "sport" subspecies of big game poaching on land: why not promote a hunting analog of catch-and-release fishing?

After all, if the idea is to prove that you have the courage and skill to get close enough to a big animal to shoot it in a vital place, it's not really necessary to shoot said animal with a lethal bullet. You can prove it just as decisively with a well-placed tranquilizer dart and a camera. Just as much skill would be required; and if we wanted, we could make it even more sporting by tailoring the drug to require precise placement and/or be short-acting.

Personally, I have somewhat mixed feelings about this proposal. While I see no convincing objection to hunting for food, I find it hard to defend the idea of intentionally hurting things that you have no interest in eating. (I have the same reservation about catch-and-release fishing. When I fish, I have every intention of eating anything I catch which is of suitable size and species; and if I'm lucky enough to catch as much as I can eat, I stop.) However, I like even less the idea of *killing* things for no better reason than trophies. Ideally, my first choice might be that hunters leave the animals entirely alone. Realistically, that's not likely to happen soon.

So if people are so determined to hunt that they persist in doing it illegally and fatally, an annoying but nonlethal alternative might be a big improvement—because it would save animals' *lives*. Yes, it would subject them to an occasional minor trauma—but would not such a trade-off be worthwhile? If you don't think so, I'm wide open to better ideas.

As I said when I started, sometimes the best answer to a problem is the one that *works* best, not the one that you *like* best! ■

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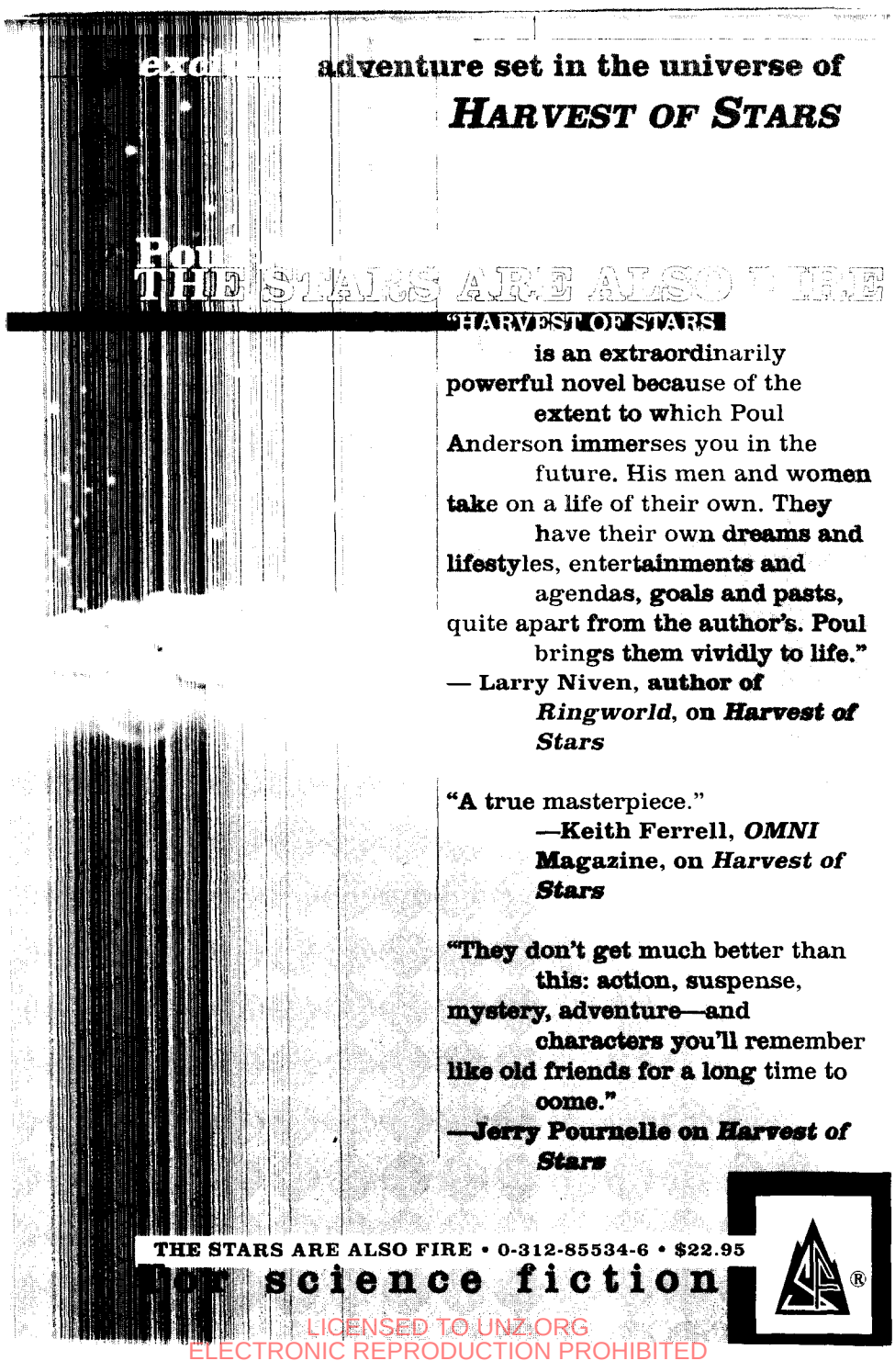
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Starmind, *has been growing ever since. It is composed of Stardancers—former humans, who have forever renounced the ability to live in a planetary gravity field, in exchange for telepathy and immortality. (Thanks to a Firefly-tailored substance called Symbiote, the complement of the human metabolism, Stardancers live naked in space, untroubled by hunger, thirst, cold, vacuum . . . or loneliness.) Their collective Starmind has been of great service to humanity, assisting in the safe development of vital new technologies—including nanotechnology —and in the cleansing of the human ecosphere. In return the Starmind asks only for trivial amounts of the trace elements Symbiote does not supply, and the right to exist. Naturally, humanity's original agreement to this bargain was grudging—but subsequent experience has confirmed that the Starmind has no need for anything that the human race considers an asset. Many humans appreciate Stardancer art and technology . . . but the overwhelming majority, of course, tend to ignore the Starmind's existence.*

As do **Rhea Paixao** *and her husband* **Rand Porter.** *Rhea is a successful writer, who has lived nearly all her life in her birthplace, Provincetown, Massachusetts. Indeed, Rand promised her, as a condition of courtship, that he would never ask her to move from her ancestral home. But now Rand, one of a handful of shapers (composers who also create their own holographic sets), has been offered an irresistible job as Resident Shaper and co-Artistic Director at the most fabulous hotel in space, the Shimizu. In order to work effectively with the Resident Choreographer and co-Director—his own half-brother,* **Jay Sasaki**—*Rand must* live *in the Shimizu.*

And any human who lives in free fall for an extended period will adapt—permanently. *Spacers (humans who live in space) are exiled from Earth as irrevocably as any Stardancer. . . .*

If Rand accepts the job of his dreams, he will become, for the first time, as famous as his wife. But if he does, Rhea must choose between her husband and her home . . . for herself, and for their eight-year-old daughter **Colly.**

The conflict being irresolvable, and the need for a decision being pressing, Rhea and Rand agree to stall. He will take the job for a trial period. Perhaps Rhea will learn to like life in space. Perhaps Rand will hate the job. At worst, the antinomy will be postponed.

This expedient creates a problem for Rand's half-brother. Even though Rand is one of the four best Shapers alive, Jay used every drop of his own clout as Resident Choreographer to get Rand the job. If his beloved kid brother doesn't stay, Jay will face the wrath of the Shimizu's manager, **Katherine Tokugawa,** *and his own job may be in jeopardy. But Jay would rather die than let Rand suspect his selection was even partly influenced by his big brother. Aside from Tokugawa, the only person in the Shimizu who knows the truth is Jay's best*

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friend, a permanent hotel-guest named **Eva Hoffman.**

Similarly, Jay is the only person in the Shimizu who knows that Eva is planning to end her life soon. At age 116, she is one of the oldest (and wealthiest) residents—and the only one who has ceased to cosmetically control her appearance. Jay is shocked to learn that she wishes to die, baffled by her reasons—something to do with the human race's refusal to either kill itself or straighten up—and terribly moved by the final favor she requests of him: that he dance for her, at her dying. He agrees to do so; and Eva agrees to postpone the event for a month while he choreographs her death-dance.

(Meanwhile, down on Terra, an unknown agency has begun working small, quirky, seemingly pointless miracles at apparently random locations. A chamberpot of urine turns to wine in Queensland, Australia; a dancer's broken ankle heals itself within seconds in Toronto; and so on. Most of these pass unnoticed by humanity at large, but soon there have been enough of them for the media to dimly sense that something odd is going on. . . .)

One month after Rand, Rhea and Colly arrive at the Shimizu, Eva meets privately with her old friend **Reb Hawkins-Roshi,** *a Soto Zen Buddhist abbot and retired Head Teacher of Top Step, the orbiting school on which humans learn to become Stardancers. To the mingled relief and annoyance of Jay, a few hours' conversation with Reb accomplishes what Jay failed to do in a month of argument: Eva cancels her suicide.*

But death comes to the Shimizu just the same. A hotel guest named Wang Bin—a miner who had earlier drawn attention to himself in a tavern with drunken tales of a "white Stardancer" he claimed to have seen out in the Asteroid Belt—manages to microwave his own brain with a homemade comm set while outdoors. And later that same day, a special Command Performance of some of Jay's and Rand's work for the five wealthiest living humans (present in the Shimizu for an economic summit) is disrupted by an assassination attempt which, though miraculously unsuccessful, leaves twelve people dead—as well as the assassin himself, killed while trying to escape backstage by Jay, with assistance from Rand.

The hit-man's death leaves open the question of which of the five trillionaires was his intended victim, and which his employer. One of the five, **Chen Ling Ho** *(an old friend and sometime lover of Eva, and her escort to that evening's performance) is the grandson of Chen Ten Li, the twentieth-century statesman who was present at the birth of the Starmind. Ling Ho has spent his life making public reparation for the sins of his own late father Chen Hsi Feng, an anti-Stardancer fanatic who launched a treacherous and doomed military assault on the Starmind in 2020, destroying a large quantity of Symbiote en route from Titan.*

(Meanwhile, down on Terra, in the Kingdom of Lo, Nepal—which controlled all trade in the Himalayas until

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the 16th century, when the Kali Gandaki River changed its location and left the castle at Kechar Dzong literally high and dry—five centuries of patient prayer are finally and suddenly answered. The Kali Gandaki returns to Kechar Dzong, as abruptly as it left....)

Attempted assassination proves almost a welcome distraction for Rhea. As the deadline approaches for her to give Rand a final decision on whether or not she can bear to live the rest of her life in space, she feels torn. Her husband has clearly never been happier, or done better work; she herself has gained enormous creative stimulation from space life, particularly from intimate "face-to-face" conversations with a Stardancer named **Buchi Tenmo.** *But lately Rhea is beginning to receive stimulation of a different sort from intimate association with Colly's guardian, the skeletally handsome young orientator* **Duncan Iowa.** *He is not only a spacer, but one of the rare spaceborn—as intrinsically interesting as his own obvious interest in Rhea is flattering. And Rand spends most of his waking hours in his studio, hiding perhaps from his own guilt at the impossible choice he has forced on his wife. Rhea finds herself seriously tempted to hide from that choice herself... in an affair.*

Even Colly, initially a zealous convert to space life, begins complaining that there are no children her own age in the Shimizu: who, she asks Rhea tearfully, will come to her ninth birthday party?

And underlying everything, Rhea is killingly homesick for Provincetown. Even the excellent holographic replica her shaper husband creates for her fails to satisfy: she cannot smell the rich aroma of sea or salt air.

CHAPTER 14

Rand had come to feel that his favorite part of the Shimizu was the corridors. They were visually appealing, padded enough for the most inexpert jaunter, and offered an ever-changing parade of rich and almost-rich people to gawk at. They were the place where one flew, where you could enjoy the sensation of a jaunt that was not over within seconds. Most important to him, they represented the blessed hiatus between the problems of the studio and the problems of the home. They were the equivalent of a solitary drive from office to home back on Terra: the place of unwinding from work, and of winding other mechanisms back up again.

But sooner or later the corridors always led him back to his door. He was coming to think of it as the Place of Sighs; whichever direction he was going, he always seemed to pause just outside the threshold and sigh, first.

He did so now, decided he was ready to enter his home, and thumbed the doorlock.

Before he could enter, something burst from the room and enveloped him. Its first effect was as invigorating as a cool rain on a dry afternoon: his wife's laughter....

As a musician he found it one of the Universe's more glorious sounds; as a husband he found it exhilarating. In either capacity, he had been missing it lately. Like an addict following the smell of smoke, he followed it inside, seeking the source.

Rhea was in the living room, a little

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northeast of the window. She was sitting in the piece of furniture in which she usually did her writing—she moved around as she wrote, and hated the sound of velcro separating as she did—but her seatbelt was not fastened. And she had configured the furniture in the shape which its menu called "love-seat." In its other corner, also unstrapped, was a broadly grinning Duncan Iowa. He had just opened his mouth to say something, to make Rhea laugh again, when he caught sight of Rand in the doorway. "Hello, Rand," he said.

Rhea turned, smiling. "Hi, darling," she said. "You must be exhausted—would you like a drink?"

He controlled a frown. "Why would I be exhausted?"

She looked surprised. "Well . . . the premiere is only a week away, right?"

"Sure—but my part was done yesterday. Jay and the dancers will be killing themselves from here on in, muscle-memorizing it, but I'm just there babysitting the software and looking for holes. I told you that last night."

"Oh. I forgot."

"Never mind." He had been hoping to hear some more of her laughter, and now she wasn't even smiling any more. *Nice work.* "What were you guys laughing about? I could use a giggle."

She shook her head. "It'd take too long to explain it. Duncan just came up with a neat way to improve some comic business in a story I'm working on."

"Oh. I see." In ten years of marriage, Rhea had never permitted Rand—or anyone—to see or hear about a work-in-progress. It was one of her many writer's superstitions. "A story is like a soufflé," was the line he had heard her tell people a hundred times. "Where's Colly?"

"Studying," She glanced at her watch. "No, by now the terminal has unlocked, so she's probably playing games or watching a movie."

He nodded. "As long as she's not on the phone again. That kid will talk away our air money one of these days."

"Oh, no, she can't be—I've got the Hatter set to warn me if she asks for a phone circuit."

"The which?"

"The Mad Hatter," Duncan said. "It's her new name for Harvey. He's still a white rabbit, but he's shorter, and dressed like the Tenniel version. You know, the guy who illustrated the original Alice books."

Rand was doubly irritated: that a strange man knew more about his daughter than he did, and that this young lout thought the best damn shaper in human space needed to be told who Tenniel was. But he still had faint hopes of hearing Rhea laugh again sometime tonight, so he pasted a big happy smile on his face. "Ha ha," he said, as if reading the words from a page. "That's cute. Pocket watch and all, eh?" *I know the fucking books, sonny.* "We'd better be careful what she eats and drinks. If she starts to grow, we'll need a bigger suite."

He was rewarded with a grin from his wife. "I don't think there is such a thing. If she does, we'll have to put her in the pool: she can have it all to herself."

"I think Colly would really like

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that," Duncan said.

"Can you stay for dinner, Duncan?" Rand asked, in the tone of voice that both sounds perfectly sincere and conveys the subtext, *a negative answer is expected.*

The lad was not completely mannerless; he pushed himself away from the love-seat and looked around for anything he might have left. "No, thanks, I have to—"

A braying sound interrupted him, for all the world like a burro's mating call. All three froze.

"FLARE WARNING, CLASS ONE," said a very loud voice. "THIS IS A SAFETY EMERGENCY. ALL GUESTS MUST GO AS QUICKLY *AND CALMLY* AS POSSIBLE TO THE NEAREST RADIATION LOCKER, AND REMAIN THERE UNTIL FURTHER NOTICE. THERE IS NO CAUSE FOR ALARM AS LONG AS YOU SEEK SHELTER *NOW*. IF YOU HAVE A SPECIAL PROBLEM, ONLY, PHONE 'FLARE EMERGENCY' AND HELP WILL ARRIVE AT ONCE. WAVEFRONT X-RAYS EXPECTED IN NINE MINUTES, TWENTY SECONDS. CLASS ONE FLARE WARNING—" It began to repeat.

"Volume mute!" Rand barked, and the voice went away. "Duncan, you're staying."

"I shouldn't," he said. "I've got my own bolt hole, two minutes away —that's seven minutes cushion."

"Don't be silly," Rhea said. "There's plenty of room in our locker, I've seen it. This suite was built for up to six." Still Duncan looked hesitant. "For heaven's sake, we're going to be in there with Colly for what, up to three days? With no phone, no TV, completely cut off from the Net? We *need* you, Duncan."

He grinned. "That logic I understand."

"We're wasting time," Rand snapped, and led the stampede.

By thoughtful design, access to the radiation locker was through Colly's room. They expected to find her in a panic—but as they cleared the door they found her oblivious, wearing earphones and fixated on a screen, talking on the phone with a hush-filter. She flinched sharply when she became aware of them; on Earth she would have jumped a foot in the air. In free fall the same reflex causes one to tumble erratically; she flailed like an octopus to regain her balance. *"It was just for a minute,"* she cried. *"I was just gonna hang up, really!"*

Rand got a grip on an ankle as it went past, swarmed up her and yanked the earphones out. "Quiet, Colly!" he said, trying to control his voice carefully so as to command instant attention without scaring her. It seemed to work.

"What is it, Daddy?"

"It's all right, baby—there's a flare on the way, but it's only Class One. We're all going on a picnic together for a little while. Wanna come?"

Her eyes got big and round. "Sure, Dad. Can I bring the Hatter? Harvey, I mean? I changed his name."

"So I hear. I'm sorry, honey—radiation lockers are meant to keep electrons out, and that's pretty much what the Hatter's made of. We're going to have to rough it, like they did in the Olden Days. Do you have any

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books around?"

"Hard copy, you mean? None I haven't read a jillion times. You mean no games, or *anything?*"

"Only if they're free-standing, hon. Nothing that uses the Net. Get your Anything Box." It was a nanotechnological toy-set, which could become a range of things, from 3-D chess set to Monopoly board to Scrabble game.

"I forgot to charge it," she wailed.

Duncan already had the locker hatch open, and was waving Rhea to enter; she held back. "Come on, Colly," he called. "You don't need machines to play games."

"You *don't?*" She looked dubious. "OK." She started for the hatch. "Hey—what about supper?"

"That kitchenette will make sandwiches in under two minutes," Rhea said, and began to turn toward the door. "We've got at least seven left—"

"No, Rhea!" Duncan ordered. "That was a best-guess, and you don't screw around with a flare emergency, for *anything.* There's food and water in the locker—come on!"

"Go ahead," Rand said. "I've got Colly."

Rhea gave up and went to the hatch. Duncan caught her as she arrived, and handed her through the door. To guide a body from behind in free fall without causing it to tumble, one pushes the buttocks. Rand had been in space long enough to know that, so he couldn't even be annoyed. He put his attention on his daughter. "Push off on me, hon," he said, and spreadeagled himself facing the hatch. Colly doubled up, put her feet against his stomach, and jumped. He used his thrusters to recover and follow her. Her aim was superb; she went through the hatch like a perfect slam-dunk and into Rhea's arms.

Duncan seemed to have assigned himself the role of doorman; he waited for Rand to precede him. "After you, son," Rand said gruffly. And as Duncan turned, he pushed the lad in, the same way he had done for Rhea.

The next few hours were not particularly pleasant ones.

Perhaps no one has ever spent a really comfortable three hours in a radiation locker. They were the only cubics in Shimizu which could reasonably be called "spartan," being simple boxes designed to keep a human alive for up to three and a half days despite the best efforts of energetic protons to kill him. (X-rays, although they arrive first, and keep coming as the following plasma cloud of electrons and protons strikes hull metal, are not a problem: a mere millimeter of aluminum will stop most of them.) A radiation locker is very easy to get into, impossible to get out of until the emergency is past, and will supply breathable air, potable water, digestible food substitutes, basic emergency medical care, and plumbing facilities. Period. If one wishes to make it congenial, one can stock it with one's own free-standing computer gear, library of music and literature, programmable furniture, or a supply of gourmet delights, for there is a fair amount of room. But almost no one ever does . . . for the same reason that people still build at

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the base of volcanos. Bad solar flares are quite uncommon for about nine and a half out of every eleven years. When the tornados come once every decade or so, it is easy to forget to keep the storm-shelter adequately stocked. So most visits there begin with a mournful inventory that is finished all too soon, followed by the dawning realization that this will be a sentence.

In this case, Rand decided early on not to dwell on the dark side of things, and resolved instead to concentrate on what *could* be accomplished while in here. So he checked his mental buffer, and found a task waiting: chewing his daughter out for using the telephone against express orders. But to his intense annoyance, Duncan interceded on her behalf ("butted in," was how Rand phrased it to himself), claiming that she deserved praise for having figured out how to circumvent an AI lock. When he rejected this as irrelevant, Colly took over her own defense, presenting in a shrill voice the novel theory: "And I'm not even getting a real birthday party; space stinks and I want to go home."

Since Rand had been counting on Colly's enthusiasm for space to help win over Rhea, he took recourse in a strangled silence. Rhea had privately asked him, several days ago, about interfacing his shaping equipment with the phone so that the friends at Colly's party could at least be convincing fakes. At the time he had been too busy, and said he would "think about it," but later he had thought it through in financial terms only, and rejected the idea on those grounds. He wanted mightily now to promise—to have promised—to do it . . . but he could not construct a logic-bridge that would get him from "You're spending too much money on the phone," to, "I'm going to help you spend a king's ransom on the phone," and did not have Colly's daredevil indifference to logic to help him. He made a firm private resolution to tackle the project—and banged his nose on the fact that he could not even begin for . . . how long did Class One flare emergencies generally last, anyway? He was forced to ask Duncan. And the answer—three hours to three days; we'll know when the door opens—did not please him. It began to dawn on him that he was going to have to fill an indeterminate time with small talk, with a wife whom he had hurt, a child he had disappointed, and a young man who was beginning to annoy the hell out of him.

In the end, it was only eight hours, and even they were not the horrors they might have been. But only because Rhea rose heroically to the occasion, and almost singlehandedly carried the group on her shoulders, quelling negative emotions by sheer force of personality. She changed subjects, she suggested topics, she refereed potential disputes before they could occur, and she took upon herself any housekeeping task that might otherwise have brought Rand and Duncan into contact.

Eventually she bullied them all into the proper bombshelter spirit. She told them endless stories, some pi-

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rated and some improvised. She cajoled Rand into singing the songs he sang best. Duncan reached back into the memory banks of a childhood in circumstances so primitive (by contemporary Terran standards) that he had frequently been deprived of amusement facilities, and pulled out game after game that could be played without tools or power. Before long Colly, too, was making her unique contribution: giggling. Not long after her usual bedtime, she fell asleep, but a child's snores and other sleep sounds are nearly as uplifting as her giggles. And it is difficult for a conversation to turn to an argument if there is a child sleeping in the room. Before long, Rand had regained his original impression of Duncan as a decent enough young man—just needed a little seasoning among Terrans to learn the fine points of good manners, that was all. After all, Rhea seemed to like him, and she had good people radar.

Good spirits might have not lasted, but luck was with them: just as group morale peaked, the locker door opened and a loud voice began reassuring them that everything was fine. They managed to silence it before it could wake Colly, and emerged smiling together. Duncan had the grace to make his excuses and leave nearly at once. By the time Rand had finished seeing him out the door, Rhea had put Colly into her sleepsack and gone to their bedroom; he put the suite to sleep and joined her. He was quite tired; the only things he intended to do before sleeping were check to make sure their AIs were still sentient, and make sure that if there were any casualties, no one he knew was on the list.

But by the time he reached the bedroom, Rhea was more than halfway out of her clothes.

"Uh . . ." he managed to get out before the process was complete, and then she advanced on him like a cloud of electrons and protons. His own clothing was no protection at all. His next syllable was some five minutes later, and was even less spellable; he repeated it several times over the next few minutes, with increasing volume and decreasing period. The last iteration was a shout, which by then seemed to him to contain all the information the Universe out there desperately needed to hear—until he heard Rhea shriek the message's other half in harmony with him.

Before he fell asleep, he regained enough intelligence to compose a platitude, something along the lines of "Out of adversity comes fortitude." Maybe . . . just maybe . . . Rhea was going to snap into it.

Talking work with Jay wasn't as much fun as it had been; with four days left before the premier of *Kinergy* (as they had decided to name the new work) Jay had too much else to do, Rand had too little else to do, and there was nothing to discuss but things that might go wrong. And the incessant ego-struggles and other personal frictions among the dancers—but Rand hated that particular topic. He had himself pointedly chosen a field that allowed him to work alone when it suited him.

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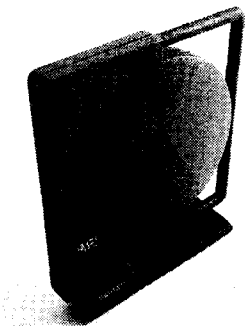

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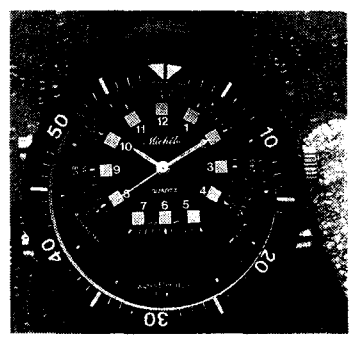

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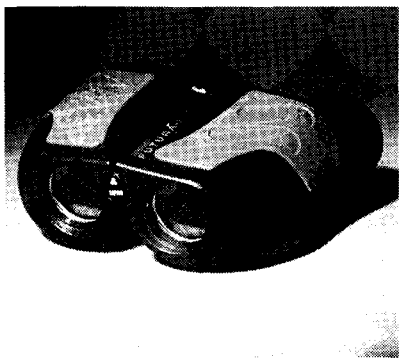

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So he had no digression to propose when Jay said, "How's it going with Rhea, bro?"

He decided to tackle it. "You know, last week I'd have said it was fucking hopeless. But it's the funniest thing: somehow that flare emergency seems to have turned things around. At least a little, anyway. She came through it like a trooper, never complained once, never even frowned—and as soon as it was over, so was she: *all* over me. We haven't had a session like that since . . . Jesus, I don't know, but whenever it was, it was back on Earth. It felt . . . it felt like christening the Shimizu, christening space. Do you know what I mean?"

Jay nodded at once. "Ethan and I christened High Orbit that way, once."

Rand winced away from the thought. Obviously the event had not cemented Ethan's commitment to living in space very effectively. "I mean, it's like when I first moved to P-town. I'd never lived by the ocean, and I wasn't sure if I could take that much horizon. And the storms, you know, the winds. And then we went through our first hurricane together, and it was hard, but when it was over I felt like, 'Well, that wasn't so bad; I can live here.' Sitting in a radiation locker isn't fun, but it's a lot more fun than sitting in a singles bar. Maybe she's going to steady down and learn to live here."

"But it's still that much up in the air, is it? With four days to curtain? You have to give Kate an answer one way or another the following week."

"I know, I know. But it's the kind of problem where you can't push for an answer, no matter how urgent it is."

"Well, all I'm saying is, if she bails out, don't necessarily assume that you have to follow her—for keeps, I mean. Just because Ethan and I couldn't make it work on a commuter basis doesn't mean it can't be done. Look at that Philip Rose and *his* wife—and he's a writer, like Rhea. Quite a few spacers have made marriage with a groundhog work."

"You really think it's an option? After what happened to you?"

"Well, maybe not a great one. But it might be worth giving it a year and seeing how it works." He seemed to start to say something, and then changed his mind. "I'm just being selfish, bro. *Kinergy* is a good piece. I like working with you; I don't want to give it up. Losing partners is a habit I'm trying to break."

Rand thought about it, and shook his head. "I hear you. But I just can't see Rhea and me staying married that way. Besides, it's not fair to Colly to yo-yo her that way, uproot her every three months."

"There are other rotation schedules."

"Doesn't change anything. If Rhea goes, my choices are her—and Colly—or my work. So you can imagine how relieved I am at any hint that she might be willing to stay."

Again Jay seemed to choose his words carefully. "Rand? Suppose she does go? Suppose the wild sex after the flare was just the bombshelter reflex to celebrate not having been killed after all? Suppose your choice

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is Rhea or Shimizu: what then?"

"That I can answer concisely and with absolute certainty. The answer is, it beats the shit out of me." He picked at a cuticle. "I really like this place. I really like this job. I really love you. But I *really love* Rhea and our kid. All I can tell you is, I'm praying it never comes up. And all hopeful omens are welcome."

CHAPTER 15
Assorted Terran Locations
19 January 2065

Hidalgo Rodriguez woke from a troubled sleep. His nightmares had been stranger and more unsettling than even a full gourd of *wheero* could account for. But opening his eyes was less than no help. He shrieked, and sprang to his feet even faster than he had on that distant childhood day in his father's goatshed when he had learned empirically that a human sneeze means "Run for your life!" in Goat.

The shriek awoke Amparo and the children; within seconds they were harmonizing with him.

Their homey familiar hovel was gone. It had been replaced, by something indescribable, almost literally unseeable. It was everywhere, on all sides, had no apparent openings, and no features that any of them could identify. The light by which they saw it had no detectable source. Their first and best guess was that it was some kind of magical trap.

This diagnosis caused Hidalgo to utter a bellow of what he hoped sounded like rage, and throw himself bodily at the nearest part of the thing he could reach. He did not really expect to break through, but he had to try. He struck hard with a hunched shoulder, rebounded, and gasped. He had not produced an opening or even a dent—but part of the omnipresent . . . *stuff* . . . had suddenly became transparent.

A window. . . .

Outside it Hidalgo saw the familiar landscape of his home region, with some odd alterations he was too busy to study. He grabbed up a rag, wrapped his fist in it, and smashed at the window. It emphatically refused to break. His hand was more equivocal; he swore foully.

His son Julio followed Hidalgo's example, racing full tilt into the nearest wall to him. When nothing happened, he picked another spot and tried again. This time he was spectacularly successful: a door appeared in the stuff. He tested it; it worked just fine . . . and the entire Rodriguez clan joined him at high speed.

They stood outside the thing for a minute or so, all talking at the top of their lungs, none of them hearing a word—or noticing the sounds of similar loud "conversations" in the near distance.

The thing was still unidentifiable. It certainly did not look like a house, or even a building—not any that they had ever seen. It did not seem to have any straight lines or perpendiculars or right angles to it; there was no chimney.

Curiosity—and the growing realization that it was *much* hotter out here than it had been inside—finally caused them to reenter it.

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They tried poking it some more. Finally Luz let out a scream. She had found a spot which caused it to grow a basin. Shouting at her to get away from it, Hidalgo cautiously approached the thing. For some reason, it had an extra faucet. He tried the one nearest him; its mechanism was unfamiliar to him, but not hard to figure out. Water came out, and swirled away.

Hidalgo gaped. His family had never, as far back as history recorded—yes, even unto his grandfather's day!—had access to running water in the home. He was rich! And there were *two* of the things. He tried the other one—and when he had grasped what it produced, he fainted dead away.

Hot water....

When he awoke, his new house was talking to him, telling him cheerfully of traffic conditions in a city he had only heard of. It showed him pictures.

Hidalgo was a little comforted when he learned, shortly, that all of his neighbors in the hillside shanty-community were undergoing essentially identical experiences. So, elsewhere around the planet, were the family of Nkwame Van der Hoof, and *their* neighbors... the family of Algie Bent and their neighbors... the family of Trojan (his parents had named him after their hero) Khamela and their neighbors... the family of Lo Duc Tho and their neighbors... the list went on. Indeed, it was never completed.

A plague of houses seemed to be loose on the world....

It took much longer for it to become apparent—and longer for it to be believed by anyone with an education—that people who lived in those toadstool houses apparently could not get sick.

CHAPTER 16
Shimizu Hotel
20 January 2065

Jay was watching the first full tech run-through of *Kinergy,* and wistfully praying God to strike him dead, when the alarm went off.

"FLARE WARNING—CLASS THREE—"

"Again?" someone groaned.

"—REPEAT, CLASS *THREE!* THIS IS A SAFETY EMERGENCY: ALL GUESTS MUST GO AS QUICKLY AND CALMLY AS POSSIBLE TO THE POOL AREA, AND REMAIN THERE UNTIL FURTHER NOTICE. THERE IS NO CAUSE FOR ALARM AS LONG AS—"

"Jesus, Class Three!" Francine said. "All right, everybody: drop what you're doing and *move.* Quietly! Rand, Andrew, kill the holo and sound—"

It vanished, and the theater reappeared.

"—PLEASE REPORT ALOUD WHEN YOU HAVE LEFT FOR THE POOL; SHIMIZU WILL HEAR YOU AND NOT WASTE TIME SEARCHING FOR YOU—"

"Nova Dance Company, all members, leaving the theater now," Jay barked.

Andrew, the tech director who had replaced the murdered Nika, was a spacer: he came popping out of the hatch from backstage like a cork leaving a champagne bottle. Jay suddenly

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remembered that Colly was back there with Rand, and headed for the tech hole to see if his brother needed any help. On the way it dawned on him that his troubles were over, or at least postponed: the company—and everyone else in Shimizu—would all still be in the pool when the curtain was supposed to go up on *Kinergy*. Rescheduling after the emergency would take days. The Sword of Damocles had extended its expiry date.

Rand and Colly were emerging from the tech hole as he reached it. Colly seemed frightened, but not panicked; Rand was looking grim. "Honey," he said to her, "Uncle Jay is going to take you to the pool. Mom and I will join you there in two seconds."

"Daddy, no—"

"Take her, Jay."

"Rhea will be *fine,* bro," Jay began, but Rand cut him off.

"I tried to phone. Not accepting calls."

"At worst, somebody in a rad-suit will fetch her—"

"It's only a little out of the way—*take Colly.*" He kicked off and fired his thrusters. Jay found himself reassuring Colly, which helped calm himself; they jaunted for the pool together.

So did most of the population. The crowd of course thickened as it neared the center of the hotel. Some had a festive, holiday spirit; some were manic; some were silent and terrified; some were being dragged, protesting bitterly, by employees in bulky anti-radiation gear. Those whose protests became loud were sedated. Every corridor seemed to have a calm, competent employee whose sole job was to keep traffic flowing, and another who said reassuring things to anyone who would listen. Colly was actually enjoying herself by the time they reached the pool area. A smiling employee gave her and Jay ear-buttons to insert; at once a calm voice was murmuring instructions in their ear. "The pool is nearly empty now. When you are told to enter, do so promptly. Look for your last initial in the large green letters on the pool wall, and jaunt to that area so we can sort you out. Look for an employee with a red arm- and legbands. If you have any emergency—first aid, medicine, need for a toilet, a missing loved one—report it to that employee—" and so on. The whole thing was well thought-out, well-rehearsed, and worked wonders in holding down the general confusion; the Shimizu had been doing this, successfully, every eleven years for the last half-century. In under a minute, all of the pool's large doors opened at once, and they were told to enter. The ear-buttons became strident on the subject of not stopping in doorways to gawk. Jay and Colly were swept along with the flow, and found themselves inside the pool, with hundreds of chattering guests.

Jay looked around, located a green "P" on the wall a few hundred meters away, and took Colly there, breathing a sigh of relief that both Rand's and Rhea's last names happened to end with the same letter. "We'll wait for your folks, pumpkin," he told the child. "This is gonna be lots more fun

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than a dumb old rad locker, huh?"

"Sure," she agreed, counting the house. "Wow! Kids I don't even know! There's one that looks *my* age—over there, see? Uncle Jay, can I go say hi?"

"Later, honey. Let's wait for your parents, OK? We've got three days, you know."

"Oh . . . OK." Suddenly she was horrorstruck. "Uncle Jay—*what about the show?*"

He grinned. "The concert, you mean. Colly, do schoolkids back on Earth still get 'snow days'?"

She blinked. "Oh. No—but Mommy told me about them. You mean like 'Sunspot days,' when the school system crashes, and you don't have to study."

"That's right. Well, your Dad and I, and the whole company, are about to have three 'sunspot days' in a row. And believe me, we can all use the rest."

"Oh. Hey, well that's great, then. Boy, it's weird to be in here without any water."

"That's right, I hear this is your favorite place, isn't it?" Jay said absently. His watch said there were a little less than five minutes left before the doors would seal; he was scanning all the door areas at once for Rand and Rhea. At this point the majority of the new arrivals were being dragged by no-nonsense employees; Jay tried to mentally subtract them from the view, and so he didn't see Colly's parents right away.

Then he did. They and Duncan were just being released by the trio of chasers who had hauled them in. They must have come peaceably, for they were all still conscious—but as Jay opened his mouth to call Colly's attention to their arrival, he noted their respective body languages, integrated them, and closed his mouth again. Something was wrong. . . .

He squinted. Duncan seemed to be saying something—whether to Rand or Rhea or both was unclear. Whatever it was required gestures to get across. Rand's reply was so emphatic that even at that distance Jay could hear it, though not what was being said, amid the general din. Rhea and Duncan both answered at once and at length. This time Rand's reply was inaudible. A few seconds' pause . . . and Duncan spun around and started to jaunt way. Rand thrusted after him, overtook him, grappled with him, both their voices were heard shouting, Rhea chased them doing some shouting of her own—

For some reason nine groundhogs out of ten who attempt to fight in space make the same mistake: intuiting that a straight punch will push them away from their opponent, they instinctively go for an uppercut. But this only sends them sliding *past* him, toward his feet. Spacers know this, and are generally ready to meet the descending chin with an upthrust knee. Jay saw his brother begin an uppercut, and winced in anticipation. Rand massed much more than Jay—a terrible *disadvantage* under these conditions.

—But for some reason Duncan did not make the obvious counter. He took the punch, failed to lift his knee, and he and Rand went past each other

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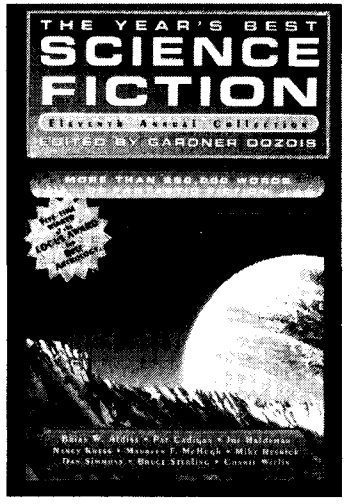

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like tectonic plates. That was all they had time for; the three chasers who'd fetched them here had already left in search of remaining stragglers, so it was a couple of the ear-button vendors who handled the job of sedating Rand and Duncan and, since she was still shouting, Rhea. In seconds, all three were at peace or a convincing imitation. The whole brief incident had gone largely unnoticed in all the general confusion.

"Do you see Mom and Dad anywhere, Uncle Jay?" Colly asked.

"No, honey," he said gently. "But I'm sure they're just fine. They've probably volunteered to help out with crowd control, since they know you're with me."

"Oh, I'll bet you're right," she said. "Daddy's real good at getting people to stay calm in a 'mergency."

"Yeah." He looked around and located an employee without arm- and legbands, a roving problem-solver, and waved her over. "How about this, pumpkin? How about if I stay here and wait up for them, and you go with this nice lady here, Xi—hi, Xi!—and meet some of those kids you saw? Xi, this is Colly Porter."

"Hi, Colly."

"Hi, Xi. Hey—get it? 'High-gee,' like the Space Commando's ship."

"That's a good one," Xi said patiently.

"Wow, suppose your parents really liked the Oz books, and they picked 'Wiz' for your last name? I have this friend named Duncan Iowa, because his parents—" They drifted away together; Colly forgot to say goodbye to Jay.

As soon as they were out of eyeshot, Jay made a beeline for the area where Rand, Rhea and Duncan had been towed and secured. A banded employee whose name Jay couldn't recall was trying to ID them as he arrived, so that they could be processed. "Those two are mine," he said. "Family."

"Fine by me, Sasaki-*sama,*" she said respectfully. "Wrap 'em up and take 'em home. What about the Orientator?"

After a split-second's hesitation, Jay said, "Process him."

"You got it." Duncan would regain consciousness in the presence of a proctor, receive a ringing lecture—and a large black mark would be entered on his record. It might even be a firing offense, if the cause of the fight had been what Jay suspected it was. His first instinct had been to cover for Duncan . . . but if it turned out that his brother had not had some good reason to take a poke at the boy, the record could always be jiggered retroactively.

"How're you fixed for antidote?" he asked the woman.

She started to say something, then shrugged and tossed him a pair of infusers from her pouch.

He towed the sleeping Rhea and Rand slowly to the "P" section—an awkward task, especially in a crowd, but not difficult for a dancer. On the way he thought things through; when he got there he left Rhea in the care of the banded employee in charge, told him to let her sleep for now. Then he located a glowing letter whose adherents chanced to include

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few children and none near Colly's age, and towed Rand there. He velcroed his brother to a support, bared his arm, triggered the infuser, and backed off a few meters.

Rand woke as quickly and effortlessly as he had fallen asleep—looked around wildly for his opponent and prepared another punch. In moments the world snapped back into focus for him. He groaned; his shoulders slumped and his head bowed. Then he drew in breath for what was going to be a great bellow of either anger or grief—but by then Jay was close again, and clapped a hand over his brother's mouth.

"Easy," he murmured. "You don't want to get dosed twice. You might—" Some mental censor made him decide not to name the most common consequence of a double-sedation: temporary impotence, "—regret it. Calm down . . . and tell me what happened." He took his hand away.

Again Rand slumped, this time all the way into free-fall crouch, a position halfway to fetal. He said nothing for long moments.

Jay already knew the general shape of what Rand was probably going to say, but it was important that Rand say it. "Well?"

His brother looked up with the expression of a man who has just lost a limb, and is trying to integrate the intellectual knowledge with his emotions. "When I got there . . . they were together."

Jay thought of six or seven things to say, hundreds of words. "So?" was the one he chose.

Rand struggled to keep his voice down. "Come on, Jay, do I have to show you a graphic?" he said in strangled tones.

Jay frowned. "You caught them in the act? They ignored a Class Three alert? I don't believe it!" *Even if it really happened,* he thought, *there simply* had *to be time for them to at least throw a goddam robe on—they're dressed now, for Christ's sake!—and if they did, there's no way to* prove *anything—this can still be fixed—*

"They were fully dressed. It took me nearly two full minutes to get there. But Jesus, Jay—*I've got a fucking nose,* OK? I've got eyes. It happened. Something happened."

"—And you don't know just what. Do you?" When there was no answer he rushed on. "It could have been a passing thought, a fleeting temptation, and some very bad timing, OK? It happened to me once: I was flirting, like you do, you know . . . and just as I started to realize it was getting to be more than just flirting, just as I was deciding to back off, his wife came in and caught us both with boners. It didn't mean a thing; it blew over. There's no way to be sure this meant anything. Give her a chance to explain, when she's over the embarrassment."

Rand looked away. "I will." He looked back again. "But Jay, I've lived with her for ten years. I've seen her look embarrassed. I've seen her look guilty. But this is the first time I've *ever* seen her look ashamed. I already know all I want to know. And I thank you for your counsel and support,

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and I would greatly appreciate it if you would leave me the fuck alone now, so I don't have a fight with you, OK? Wait—where's Colly?"

"She's covered," Jay said. "Take it off your mind. I'll go get her as soon as I wake Rhea up. You sure you'll be OK here?"

"No, but moving won't help. Go."

"Listen to this when you're ready," Jay said, handing Rand his own earbutton. "It'll tell you the procedures." And he left his brother alone to mourn.

As Jay was returning to "P" section, he found himself humming a tune in a minor key, and suddenly recognized it as a nearly century-old Stevie Wonder song called "Blame It On The Sun." The irony was too unsubtle for his conscious mind; he stopped humming. He knew he should be sad for his brother, he intended to be as soon as he could, but for now he was too numb. Too much going on; too much still to do; an eight-year-old still his nominal responsibility—to whom this all must somehow be explained before much longer. Then, three days or more locked in a can with the problem. His head began to throb.

Rhea came out of it as quickly as Rand had—and began blushing the moment she focused on Jay's face.

"What happened?" he asked. "No, forget that: *how much did he see?* How much can he prove?"

Her eyes widened as she took his meaning. "Oh, Jay—"

He turned away. "Damn it, Rhea . . . damn it to hell . . . *fuck* it to hell—"

"Where's Colly?"

"Having a jolly time in the company of a very nice lady, meeting other kids," he said bitterly. "I'd say we have at least another ten minutes before you're going to have to explain to her why Mommy and Daddy aren't talking to each other. And why Uncle Duncan has a bruise on his chin. But you're a writer: I'm sure you can improvise something."

"She doesn't call him 'Uncle Duncan,' " she said absurdly. And then: "Oh . . . my . . . God. . . ."

"MAY I HAVE YOUR ATTENTION, PLEASE," said a loud and omnipresent voice. It repeated twice, as the hubbub dwindled, then went on, "WE ARE VERY PLEASED TO REPORT THAT THE CLASS THREE FLARE ALERT WAS A FALSE ALARM—REPEAT, THE ALERT WAS A FALSE ALARM." The hubbub became an uproar; the voice got louder to compensate. "THE EMERGENCY IS OVER. TO MINIMIZE CONFUSION, PLEASE RETURN TO YOUR STATEROOMS BY LETTER-GROUPS, BEGINNING WITH THOSE WHOSE LAST NAMES BEGIN WITH 'A' AND THEIR FAMILIES. PLEASE DO NOT TRY TO LEAVE UNTIL ALL THOSE IN THE PRECEDING LETTER-GROUP ARE GONE. THE SHIMIZU APOLOGIZES FOR ANY INCONVENIENCE, AND THANKS YOU ALL FOR YOUR CO-OPERATION DURING THE EMERGENCY—"

"Jesus Christ—" Jay began.

"Take her home for me, Jay," Rhea blurted, and jetted away before he could object. She mingled with the crowd whose last names began with "A," and was lost from sight. Jay stared after her, feeling his headache gather

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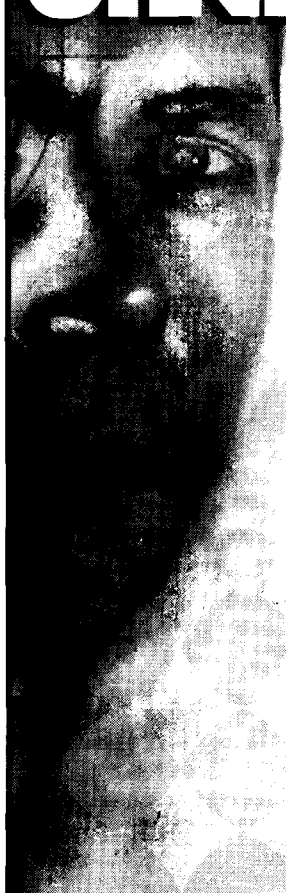
THIS SIDE OF JUDGMENT

J.R. DUNN



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force.

Within moments, Colly appeared, trailing a frantic Xi. "Did they show up yet, Uncle Jay?"

He started to say no automatically. But then he had the thought that in the near future, a lot of people were going to be lying to this child, and he didn't want to be one of them anymore. "I caught a glimpse of them," he said, then skated quickly off the thin ice. "But we'll never find them in this madhouse now. That's OK; I'm sure we'll meet them back at your suite—" Whoops, hitting thin ice again, "—eventually. Say, did you meet any interesting kids?"

"Wow, yeah—I met a boy my own age, named Waldo, and he's a spacer, like me: *he's* gonna be here forever too! I never saw him around before because he's got something wrong with his muscles and he can't go out and play—but who cares? I can go to *his* house and we can be friends *forever!* I invited him to my birthday party—"

Don't count on it, pumpkin, Jay thought, but all he said was, "He sounds nice."

A lot of people's plans were going to be changing soon. . . .

He had already left the pool with the rest of the S's, was in the corridors with Colly, before it sank in: *Kinergy* was going to go on at the appointed time after all. . . .

In common with most of the choreographers who ever lived, Jay had, two days before curtain, no idea whether he was on the verge of artistic triumph or disaster. It was no longer possible for him to evaluate the work, either objectively or subjectively. He was prepared to take the most ignorant amateur criticism to heart, or discount the most informed professional praise. The final, and only important, verdict would come two nights from now, in the form of applause or its embarrassing absence or—God forbid!—active booing. He burned to know what that verdict would be . . . and feared to find out. The only thing he knew for certain was that he could definitely have used another week to polish the damned thing. That was why he had welcomed the flare emergency.

And all the fucking emergency had accomplished was to cost him his tech rehearsal—and shatter his brother's world.

Well, perhaps there was a relatively bright side to all this—at least from Jay's point of view. Presumably Rhea would go back dirtside now—that might even be why she had done it. That would leave Rand no real choice but to stay here in space! The only place waiting for him on Terra was Provincetown, Rhea's town. He'd be miserable for a while, sure, but as Sam Spade said, that would pass. He'd heal. A season of his own original work, some media massage courtesy of Ev Martin, a few thunderous ovations. . . .

O, shit! Would Rand be in any shape to come to the premiere?

Jay assumed his brother would not make the remaining two days of rehearsals—and that would hurt, but Andrew could probably handle things alone. Jay also knew he would miss Rand's companionship, his services as

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a sounding-board, the last-minute inspirations he might have contributed—and that wasn't fatal either.

But Kate Tokugawa would be livid if Rand did not appear at the premiere. His presence was *required.* All the media would be there. It was a matter of face. Hers, and the Board's.

In his heart, Jay knew face was as low in Rand's present scale of values as it was high in Kate's. Oh, this was more than a tragedy: it had all the makings of a catastrophe.

"I wish that dumb old flare wasn't a false alarm, Uncle Jay," Colly said. "That was starting to be fun."

Guilt tore at his heart. He thought *he* had problems? "Me too, honey," he said softly, tightening his grip on her small hand. "Me too."

What the hell am I going to do with her?

"Sergei?" he tried.

Personal AIs were back on-line. "Yes, Jay?" Diaghalev said.

"Excuse me, Colly, I have to check on something with Andrew. Sergei, hush-field, please." The sounds of the crowd around him went away. "Phone Rand."

"Not accepting calls, Jay."

"God dammit, emergency override 'P-Town'!"

Rhea answered. *"What?"*

"What do I do with your daughter?" Jay asked brutally.

There was a short silence. "Can . . . can you take her? For a while, anyway?"

"What do I tell her?"

He heard Rand say something angry in the background. ". . . Something good, OK?" she said. "Please, brother? I'll call you when . . . when we're ready for her."

It was the word "brother" that made up his mind. Rhea had never called him that before. She was begging. "OK." He was prepared to end the conversation, but could not decide how. Did he say "Good luck"? Instead he said, "I'll wait for your call. Off."

Something good, OK?

"Colly, you're coming home with me. The cronkites want to interview your Mom and Dad about the flare—you know, celebrity on the spot stuff."

It was weak; no one had interviewed them after the previous, genuine emergency. But Colly bought it. "Neat! Maybe we can watch it at your house—they'll probably rush it onto the Net—"

Jay winced. "Well, maybe not right away. It'll take time to edit, you know—"

"Phone, Jay," Diaghilev said. "Two calls waiting: Andrew and Francine."

Jay wished someone would solve brain-cloning. "Colly, excuse me; Sergei, give me both of them; Andrew, Francine, I can't talk for long right now, but . . ." His mind raced, ". . . uh, today's a wrap. We'll do the tech rehearsal tomorrow at noon; first dress after supper; final runthrough will have to be the afternoon of the performance."

"Are you sure, Boss?" Francine asked. "We could do the tech tonight—cancel the pony show."

"No," Jay said. "After something like this, the cabaret show is *essential.* I won't be there, but trust me: you'll

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never have a better house. They'll cheer themselves hoarse, and tip like Shriners. Everybody needs to celebrate still being alive—" *Well, almost everybody....* "—and not being trapped in a swimming pool for three days. I've got to go; I'll leave my notes from this afternoon with your AIs later and talk with you tomorrow. Off."

"Calls waiting, Jay: Katherine Tokugawa, Evelyn Martin, Eva Hoffman... and another just coming in, Duncan Iowa."

"Suffering Jesus! Flush Iowa and Martin, tell Eva I'll call her back, refuse all further calls, and give me Kate. Greetings, Tokugawa-*sama*—some excitement, eh? I know why you're calling, and don't worry: we'll be ready when the bell rings—"

By the time he had given his boss every reassurance he could counterfeit and gotten her off the phone, he was back home. Once inside, he turned Colly over to the Mad Hatter; it checked, learned that Room Service was not yet back on-line, and led her off to Jay's personal pantry, glancing irritably at its pocket watch, for the stiff peanut-butter-and-jelly it knew she required. Jay took a deep breath—

—Let it out; took another—

Thought longingly of a drink, and retracted all the furniture in his living room, and began to dance. And kept on dancing, ricocheting around the room in great energy-wasting leaps and landings and spins and recoveries, until his body was as exhausted as his brain. He poured all his fear and confusion and guilt and anger into the dance... his irritation with his beloved brother, for picking now to be betrayed... his sneaking sympathy for the bitch who had picked now to put the horns on his brother... his heartbreak for the small child who was about to become a helpless leaf in a storm she would not understand for years....

When he finally stopped, Colly's applause startled him. He had not been aware of her watching, hadn't thought to censor what his body was saying. But she was not disturbed by his dance, only impressed; her applause was sincere. She was oblivious to her doom.

They ended up napping in each other's arms.

CHAPTER 17
Nova Dance Theatre, Shimizu Hotel
22 January 2065

Early on in the dance, Eva knew she was in good hands, and relaxed.

You couldn't always tell, that early. Sometimes a serious dance was over before you had decided whether you liked it or not. Every piece must, along with what it actually conveys, explain to you the rules by which it is meant to be judged, and sometimes that subtext can take as long to grasp and evaluate as the work itself. For that very reason, Eva had avoided seeing any rehearsals, so she could assess the finished work fairly. But a minute or so into *Kinergy*, she stopped praying that her friend's work wouldn't bomb, and became lost in it. Jay and his brother had meshed well, for the second time: this

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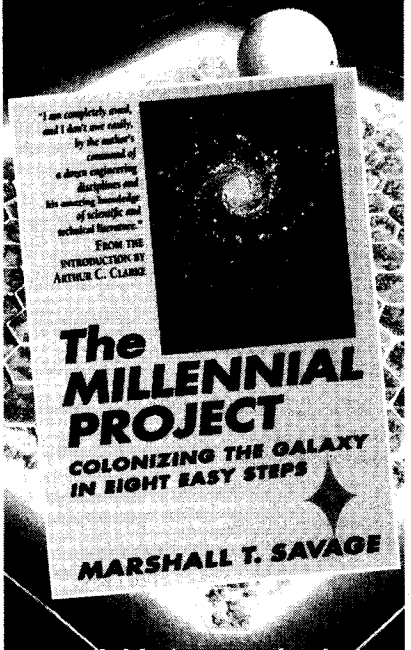
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piece, despite its origins in the turgid head of Pribhala, was even better than *Spatial Delivery* had been.

It was not as cerebral as that piece, nor as simple. For one thing, it was staged in the sphere rather than in proscenium, so it had to work in any direction. The stage was bare: apparently none of the standard vector-changing hardware of free fall dance was going to be used tonight, which meant the dancers were going to work harder. The piece's title was another clue. *Spatial Delivery* had been a single pun, based on a long-obsolete term—but *Kinergy* was a cascade of overlapping ones, synergy/kinetic energy/kinship energy/kin urge, all primal concepts of the human universe, as old as DNA and as unlikely to ever become dated. It had opened, in fact, with two chains of six dancers unwinding from a double helix in a sudden burst of illumination. The musical accompaniment that appeared as they separated was likewise timeless: the tones of its individual voices did not precisely match any classical instrument, but neither did they sound electronic. The music they made together was difficult to categorize; one could have imagined such music being played at just about any time in history. The dancers were costumed as neutrally as possible, in unitards that matched their complexions, with hoods that masked their diversity of hair styles and colors, and with oversized wings and disguised thrusters.

Nor did the ensuing choreography seem to contain any period or style "flags" in its movement vocabulary—not even those characteristic to its creator. Eva was familiar with most of Jay's work, and might not have identified this as his if she hadn't been told: he had managed to transcend his own limitations.

Ordinarily, for instance, he hated unisons, referred to them as "redundancies," and tended to use them as little as possible—but once his two chains of dancers had separated into twelve individuals, they spent several minutes dancing in unison, changing only in their dynamic relation to one another, like birds altering their formation in flight.

Eva slowly realized that the piece *did* have an unavoidable period flag: since the dancers were weightless, the dance had to belong to the twenty-first century. Few of its sweeping movements could have been performed any earlier in history, on Terra, without the help of special effects. But as that realization came to her, Rand's shaping began, and cut the piece adrift in time again. The audience facing her on the far side of the theater went away; the dancers were now flying in a blue Terran sky that went on forever, peppered with slow-moving clouds. The Sun, its brilliance tempered to a tolerable level by an intervening cloud, was directly opposite Eva, so her subconscious decided that she was lying on her back, *mere thousands of meters above Terra,* about to fall, an effect so unsettling that she grabbed for her seatmate. (Glancing briefly around, she noticed that many others were doing the same—but not those who were spaceborn.) But the clouds

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and dancers did not recede, she did not "fall"; before long she relaxed and accepted the fact that she could float in a gravity field, that she was simply lying on a cloud. She resumed watching the dance.

How old is the concept of fairies? Of winged humans who play among the clouds? These dancers played *with* the clouds, buzzing them, bursting through them, batting them to and fro like fluffy beachballs. A sextet formed, grabbed each other's ankles and made a great circle just in time for a cloud to thread it in stately slow motion. Another group at the opposite end of the theater seemed to echo the phrase, but contracted as the cloud was passing through their circle and pinched it into two clouds; the sextet broke into two trios, and each took one of the cloudlets to play with. The remaining six formed a puffball, like fish in the pool, with a cloud at their center; it slowly expanded outward through them, moving up their torsos, and became a translucent wispy sphere around them, then a globe of water, swirling with surface tension. All six came apart from each other and burst the bubble: it popped with a comical moist sound and sent droplets cascading in all directions like a cool firework blossoming. The ones coming toward Eva vanished just before arriving.

She was delighted. The simple beauty of weightlessness, which became prosaic for every Shimizu resident through daily familiarity, was made magical again by the setting. In this context, the dancers seemed somehow *more than* (or was it less than?) weightless; they seemed to be nearly massless as well, ethereal. They could meet at high speed without apparent impact, change vector so that it seemed to be their will rather than thrusters which caused the change, bounce from a cloud as easily as penetrate it, pivot on a passing breeze.

Fetch a Sumerian shepherd with a time machine, give him an hour or two to get used to zero *g*, and show him this piece: it would communicate to him instantly. The same for a Cretan stonecutter or a medieval alchemist or, Eva imagined, a hypothetical twenty-third-century energy creature. There were probably *apes* who would appreciate this dance. The creative audacity of trying to rekindle the ancient wonder of flying, for people in an environment where one had to fly to get to the bathroom, people who had been striving since their arrival inboard to become blasé about that very miracle, was inspired. Eva had been in space for a long time, and this was the first time in years that she had reflected on how *lucky* she was: that mankind's oldest dream—to fly like a bird, and never fear hitting the ground—was for her commonplace.

During the brief interval between movements, Eva reached up and tapped the program-button in her ear; she had deliberately not audited the program notes before the piece began, but now she wanted to know what the creators had to say about it. She heard the recorded voice of the immortal Murray Louis, reading from

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one of his own books:

"Performance is not mired, it floats. It exists upward, it hovers. It is immediate. It happens. It has no roots, it feeds from the air. It floats above all the tangibles that create it. From its loftiness, its aura descends and permeates all, lifted everything to its height as well as its depth. Performance is the revelation that speaks for itself."

She switched off as the credits began; the second movement had begun. During the interval the dancers had all exited—seeming to shimmer out of existence, one by one—and the clouds had thickened into banks of rolling thunderheads that blotted the Sun and darkened the sky. Now the darkness was nearly complete; one could just make out individual billowings in the roiling storm. The temperature seemed to drop slightly, and the air pressure to rise.

Suddenly, with an earsplitting crash, a fractal fork of lightning arced between two prominences. It came *toward* Eva, ended only meters from her; for the second time she clutched her seatmate tightly. The audience gasped, then muttered and tittered nervously. Five or ten seconds later a second bolt, shorter and with a different vector, again gave a snapshot of the interior of the storm. The music began to sound like mountain horns in the far distance, great deep bass tones punching through intervening winds. Another bolt, crookeder than the last, flared and died . . . then another, and another. Their randomness was convincing; they came anywhere from two to twenty seconds apart, lingering in the eye for nearly a second.

Then all at once all twelve dancers were there, caught in the sudden glare of God's flashbulb, frozen in tableau. Again the audience murmured. The next flash found them in a different tableau, and the next. Sometimes they were arrayed as two sextets, sometimes as four trios, or three quartets, or a septet and quintet, or six pairs; sometimes they were simply twelve lost individuals. No matter how close together the flashes came, the dancers were never caught in motion. Eva wondered how they managed to navigate to each new position in the dark without colliding, but refused to let herself speculate on how the trick was being done, preferring to simply enjoy it. Soon she was noting patterns in the progression of patterns itself. The whole thing began to remind her of the ancient computer game called "Life," in which a collection of cells changes shape and structure in successive frames, "evolving" and "growing" according to simple rules. This was like a three-dimensional Life sequence run at a very slow frame rate, had the same weird but intuitively appealing beauty, constantly changing yet remaining stable over time.

Just as seeming chance brought the dancers fairly close together in a cluster, an especially bright bolt of lightning lingered longer than usual, split again and again, fractured into a hundred snake-tongues of fire that raced around the entire storm—and in their flickering light, the cluster of dancers began to move in space, turning end

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over end like a Catherine wheel. As the actinic sparkles faded slowly away, the dancers themselves began to glow softly, somehow emitting their own light, shining from within like fireflies. They began to move bodily, too, without losing their place in formation, first in unison and then individually, and before long the tension of their solos tore the cluster apart into smaller groups.

Two of the groups, asymmetrically opposed, began to leave trails of light behind them as they moved. Short at first, mere afterimages, the trails slowly lengthened until they were winding tails, as though the invisible eraser that chased them were falling farther and farther behind—then they vanished, and three other groups began to leave trails of their own. Soon dancers were making light sculptures all over the sky, like particle tracks in cloud chamber, occasionally mirroring one another for a time and then diverging. Again Eva was reminded of something from the dawn of the Age of Silicon: a screen-saver program called Electric fire. The effect was hypnotic—but a kind of hypnosis that made the pulse race and the breath come faster, a *heightening* of alertness. Forks of lightning still flared here and there among the clouds, imbuing the whole scene with a sense of energy, largeness, danger. Perhaps there were subsonics buried in the score as well. One sensed that something awful, cataclysmic, might happen if one of the dancers missed a movement, distorted the weave of the incomprehensible pattern they were shaping together. Something on the scale of Ragnarok. The speed and intensity of the dance increased, until all twelve were racing to and fro at the highest speeds they could reach without crashing into the unseen audience, threatening to lose control and do so. The very clouds seemed to back away from them. In their boiling frenzy, they came to resemble the classic historical footage of the Fireflies confronting Shara Drummond . . . save that they were not red. Each glowed a *different* color now, twelve distinct shades; together they seemed to be the shards of a proto-rainbow struggling to form.

As the music swelled and steadied, they succeeded: seemingly by chance, they settled one after another into the same stable orbit, a great ring whose axis kept changing, like the "orange-slice" orbit of Peace Monitor satellites around Terra, like a primitive model of an atom with twelve electrons. Their trails became one orbit in length: a coruscating rainbow chased itself around the globe.

A short blast of trumpets, and the rainbow flared, doubling in brightness. Each and every cloud dissolved into a trillion spherically expanding droplets of water, a trillion seeds, each carrying with it a tiny reflection of the rainbow. As they dispersed and vanished, the storm clouds lightened in color and mass, thinned out, became wispy, melted away save for a handful of benign white clouds. The storm was broken; the Sun returned, and the achingly familiar blue of the Terran sky. (Even spaceborns, studies had long shown, resonated emotionally to that color; it seemed to be in

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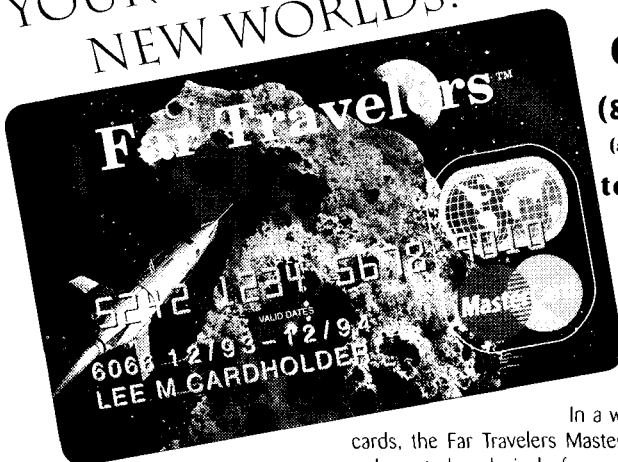

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the DNA somewhere, though none could say how.) The music moved gradually up the scale, from deep baritone horn sounds to medium frequencies that sounded eerily like human voices, yet moved in ways no human culture sang. The dancers glowed so fiercely now that they seemed to have enlarged, and their features were indistinct.

Then the rainbow-ring came apart, and they were again the playful, independent sprites they had been in the first movement—but shining, gleaming. The voices became a vast choir, hundreds of voices singing their hearts out in a language Eva had never heard before. The net effect was dysharmonic, but occasionally little resolutions came and went, as if the choir were singing a dozen songs in a dozen keys simultaneously.

The blue sky turned to gold. Groups of dancers formed, interacted and broke up with dizzying speed. A quartet would come together, agree on a movement phrase, split apart and bring the phrase to other groups, which made up new phrases to combine with them, then split apart in their turn. Choreographic ideas appeared spontaneously and spread around the stage like heat lightning or rumor. A unison formed by apparent accident among the twelve, dissolved, then returned—while in the score, more and more singers reached agreement on a key and rules of harmony, until they too were working together to build something. Dance and music together established a stable base and began to climb higher.

Literally! Clouds came toward Eva, and wind into her face: she and the dancers were rising, leaving unseen Terra behind them. The illusion was utterly convincing, and quite breathtaking. The wind fell away, and they left the clouds below; the golden sky began to darken again—not the turgid dark of the storm, but the pure star-spattered blackness of space.

No, not pure. They traveled through a fine mist of some kind of dust. Red dust. It began to accumulate on the bodies of the dancers, until they were caked with it, coated by it, covered in it, each of them glowing a shade of red: ochre, umber, amber, gold, crimson, scarlet, ruby. It was Symbiote, and they were a dozen newborn Stardancers, spreading their wings now, spinning them out into lightsails, joyously learning a new way to dance together, rubbing together like blobs in a lava lamp.

Eva put all of her attention on keeping perfectly still and calm. It was difficult—but Reb had trusted her. Many decades of lucrative poker came to her aid.

Briefly the twelve boiled together at the center of the stage like swarming bees, a "quotation" of the Fireflies who had given mankind the Symbiote—then they opened out again, formed a spherical matrix . . . and folded gracefully together into the *kukanzen* posture of those who meditate in space, each facing out from the center, away from all the others. Together they bowed to the Universe; the music resolved at last into a major chord spanning the entire audible range; dancers and music began

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to fade away, like Cheshire cats, until there was only silence and infinite space and the burning stars; then they too dwindled and were gone.

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Eva let herself glance at Jay and Rand, now, as the house lights came up. They were together at the opposite end of the vip section, unbuckling their belts to join the dancers for the bow. Her eyes were not what they had once been, but she had a century of experience in intrigue: one glance at Jay's face and she was intuitively certain *he* didn't know Reb's secret. Rand was much harder to read. Ev Martin—hearing that Rand's wife had left him yesterday, taking his daughter back to Provincetown with her—had spoken with the house physician. The shaper was stoned to his cheeks, smiling beatifically. His eyes were wounds, and he was jaunting like a tourist, but he would pass muster for the media.

Could *Rand* know something? Unlikely . . . but then, it was a visual that had shocked her, rather than a choreography. Still, perhaps it was just coincidence. . . .

The crowd was merciless in its admiration, demanding eight curtain calls before the exhausted dancers were allowed to go backstage and peel off their soaked costumes. Eva stopped clapping much sooner; her aged hands gave out. Finally the ovation was over, and her companion, Chen Ling Ho, was murmuring, "I liked it very much . . . despite the ending."

Again she had recourse to her poker experience. "Wasn't that blackout section terrific? Where they did the tableaux in the lightning flashes? How do you suppose they got around in the dark without a train wreck?"

"How do I get to Carnegie Hall?" the trillionaire replied.

"You can't possibly be old enough to remember that joke—Carnegie Hall was torn down before you were born!"

His eyes twinkled. "I like to think of myself as a student of classical humor."

She blinked. " 'Your money or your life?' " she asked, quoting a radio comedy routine.

Chen gave the correct response: dead silence.

She rewarded him with a smile, unbuckled herself with one hand and took his arm with the other. "Let's head for the reception—I want to congratulate the boys before the crowd beats them stupid."

Rand and Jay were already glazing over by the time Eva elbowed her way into the receiving line with Chen, but she caught their attention—and managed to fluster them

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both—when she said, "Lads, somewhere Willem Ngani is smiling tonight."

"He'd have loved that piece," Chen agreed, and the two thanked them, both stammering. Then Eva let herself be chivvied away by assistant cronkites—this was the worst possible time and place to probe Rand's secret thoughts.

She and Chen returned to her suite. He accepted a drink, and they moved to the window. Terra was about a quarter full. The illuminated crescent contained China; twilight in Beijing. They shared a silence for a few minutes. Then he said, "You did not respond to my criticism of the ending of *Kinergy*. Did you like it?"

She felt like she was juggling eggs in a gravity field. "Yes. It resonated for me. What didn't you like about it?"

"The Stardancer motif."

"Too obvious?"

He hesitated. "Yes, that."

"Something else?"

Again he hesitated. "You know my true feelings toward the ones in red."

"Not really," she said. "I'm aware that you're not a major fan—and that you don't want that publicly known. Given your father's history with the Starmind, I understand that. But do they really bother you so much that a reference to them spoils a work of art for you?"

"Yes."

"For heaven's sake, Ling, why? Personal feelings aside, you of all people must know how much the human race owes them—"

"Precisely. How then can I not resent them?"

"Oh, that's silly!"

There might not be another person alive privileged to say that to Chen Ling Ho; from Eva he took it. "Gratitude implies obligation. The scale of the obligation is, in this case, horrifying."

"But there's almost nothing they want that we have—just trace elements we'll never miss. The bill will never come due."

He nodded, and again said, "Precisely. That makes the obligation even more intolerable. It is, on both sides, literally unforgivable."

She frowned. "There's more to it than that."

"What do you mean?" he asked.

"You're not mankind. Your personal share of the debt . . . well, with your resources you could probably pay cash. At most, it's a philosophical abstraction. To spoil a dance, something has to have its roots in your gut, not your head. What really bothers you about the Starmind?"

"Their virtue," he said.

"Come again?"

For the first time, emotion came into his voice. "They are so damned virtuous! So relentlessly admirable. My instincts tell me to despise and fear anyone who appears above reproach. Their harmlessness disarms us. Again, literally! We allowed them to abolish war for us, allowed them to strengthen the United Nations into a true world government. Perhaps war is not, after all, a truly necessary evil—there are more efficient ways of getting rich now—but we may find one day that it was necessary in ways

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we do not yet grasp."

"Jesus, Ling—you want *war* back? Even I'm not that nostalgic."

"I feel in my heart that in the old days, when we were a brawling, clawing, struggling world, we were more human. Now we grow fat and soft on the riches flung down to us from on high—and because our short-term wealth has *temporarily* overtaken population growth, *we have stopped fearing population growth.* One day we will reach a point where no input of new wealth can help us . . . and then civilization will fall, and millions, billions, will die. Conceivably *all.* All humans. But not the Stardancers. They may *never* die." He heard emotion creeping into his voice and caught himself. "You understand, I do not discuss these matters publicly. Stardancers are much beloved. In this age, no man can hold real wealth or power save he treat with them. Humanity is drunk, today, happily drunk, and in no mood for grim warnings. But how can the Neanderthal not hate the Cro Magnon, Eva?"

She nodded. Time to change the subject. "Well, I can't say I share your feelings, but at least I think I understand them now. Thanks for explaining. I'll remember not to buy you the new Drummonds holo for your birthday."

"Oh, no," he said. "Please do, if you like. One may admire the exquisite gyrations of cancer cells in the microscope. The choreography of the Stardancers I find very appealing; it's only their existence that offends me."

That made her smile. "It's a shame your country gave up emperors, Ling. You'd have been one of the great ones."

"One hates to be a merely good emperor," he agreed, and finished his drink.

She followed suit. "Are you sleepy?"

"No."

"Shall we go to bed?"

He bowed and took her hand. "All my life I have wondered why other men prize young women."

"Perhaps," she suggested, "they do not feel they deserve the best."

He smiled, and came closer.

CHAPTER 18
Washington, D.C.
28 January 2065

The assistant director of the United States Internal Revenue Service knew that her office was as snoop-proof as human ingenuity could make it. Nonetheless she got up from her desk and personally made sure her office door was locked. Then she told her AI to cancel all appointments for the day and hold all calls, and opened a "Most Secure" phone circuit to Brussels.

Her global counterpart, the Right Honorable Undersecretary of Revenue for the United Nations, and Assistant Chairman of the Committee on Fiscal Anomalies, answered promptly. "Hello, LaToya. This is early in the day for you to call. What is it, eight A.M. in Washington?" He looked closer. "My God—are you ill?"

"I've been up all night, George."

The Undersecretary sighed. "Something serious, then. All right, which hat shall I wear?"

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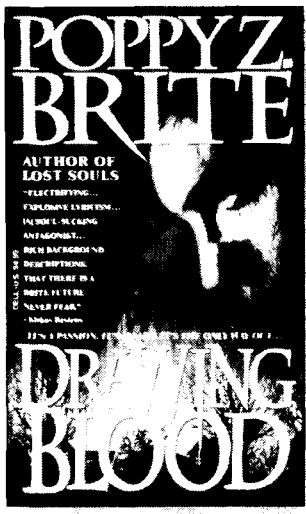

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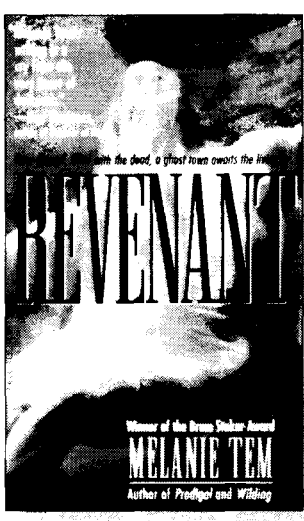

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"Both of them, I think. And hold on to both. You may have to invent a third hat: I don't think there's any precedent for this."

A sigh. "Go ahead."

"George, I've run the integrations through again and again. I used three methods, different machines, I even had the software triplechecked."

"And—"

"You'll be receiving more than you're expecting from us this year."

The Undersecretary lifted an eyebrow. "How much more?"

"On the order of 10 percent."

The other eyebrow rose to join the first. "You are telling me the gross national product of the United States has taken a 10 percent jump. *Up.*"

"That is part of what I'm telling you. I talked with Jacques and Rogelio last night, and they report nearly identical bulges. Jacques puts his at 9 percent; Rogelio is running behind, but says Mexico will probably run eight."

The Undersecretary was frowning. "So someone is pumping serious money into North America. Is it real, or just pixels?"

"As far as I can learn, it's genuine money."

"Where's it coming from?"

"It falleth as the gentle rain from heaven. Drop by drop—all over."

A grunt. "Stonewalled, eh? Very well—where is it *going?* Who's paying taxes on it? What categories?"

"Take a tranquilizer."

The Undersecretary frowned, then did as he was bid. At once the frown smoothed over. "Go ahead."

"One category: self-employed income."

"Self-employed?" That was the last sector in which he would have expected such a surge in earnings. "Any breakdowns as to subcategories yet?"

The Assistant Director nodded. "Again, one. Self-employed artists."

The Undersecretary stared. After a full ten seconds of silence, he said, "What kind of artists?"

"All kinds of artists. Live theater, dance, film, music, literature, sculpture, painting . . . what it comes down to is in every genre and subgenre there is, from grand opera to street theater, roughly 10 percent of the working professionals have had a very good year."

"And all from the same source?"

"No. Maybe. I don't know. I suspect it, because it all seems to be coming in the same way: anonymous donations, rather than grants or box office. One donation per artist or arts group. Substantial ones."

"But then it's simple!" the Undersecretary said. "Who's declaring the increased donations on their taxes?"

"That's the problem. Nobody. Not in North America anyway. But why the hell would someone overseas want to take such a huge flyer in North American art?"

"Confusing," the Undersecretary agreed.

"Confusing, hell. It *worries* me, George. Good news on this scale is ominous. I smell a swindle of some kind."

"I don't suppose there's any chance these benefactors are North Americans who elected for some reason not to claim. . . ." He trailed off.

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She politely pretended she hadn't heard him. "Will you look into it, George? *Quietly?*"

"I'll get back to you," he said, and broke the connection.

For the rest of the day work devoured her attention, but she fretted most of the night. The next morning at the office she flinched when her AI said, "The Undersecretary of Revenue."

"Accept!" she said at once.

"He is not on the phone, ma'am. He is in your outer office."

"Jesus." She took a deep breath, and rose to her feet. "Admit him."

Two bodyguards entered first, scanned the room carefully, and nodded through the door. The Undersecretary came in, and dismissed them with some unseen signal. She started to come around her desk to greet him, but he waved her off. They sat together; he came to the point without formalities. "This room is secure?"

The Assistant Director checked a telltale. "Yes."

"It's happening all over the globe. And in space. High Orbit, Luna City, everywhere. Has been for over six months now."

"Everywhere? The same way?"

"Not everywhere. Just the places where people make art for money. But all of those."

She looked surprised. "All? You don't have up-to-date data from all, do you? I thought there were several nations still refusing to switch over to a December 31 tax deadline."

"True; there are nonconforming nations. But almost *all* nations require self-employed artists to report quarterly. I can't prove there are no exceptions, yet, but I'd bet money. The pattern is clear."

She powered her chair back away from her desk until it hit the wall. "Isn't this the *damndest* thing?"

"Have you anything new to report?"

It took her a few moments to respond. "Null results, mostly. I tried to do further breakdowns and correlations, to see if I could get a clue regarding motive. *Which* artists are getting money? Why them? How much? That sort of thing."

"And?"

"Nothing helpful. Some of them are starving-in-a-garret types, but some are major stars or companies, and some are in between. No geographical, financial, political, religious or even aesthetic connections I can find. Competing schools of theory, some of them. The one steady correlation I've identified tells me nothing useful."

"And that is—"

"The amount. Apparently, each lucky beneficiary—from the poorest poet to the richest director, from barbershop quartet to symphony orchestra—has had his or her annual budget approximately quadrupled. In a few cases, that comes to megabucks."

The Undersecretary nodded grimly. "That accords with what I've been able to learn."

The Assistant Director paled. "Good God, George—there are less than a dozen fiscal entities on or off Terra who are in a position to disburse *that* kind of money—"

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"I know."

She got a grip on herself. "So you went to the Secretary."

"I deemed it necessary, yes. This is too big for a bureaucrat like me; I needed a statesman."

"And he said—?"

"He said that an anonymous donation is an anonymous donation, regardless of size. He said no law requires a philanthropist to take a tax deduction. He said support of the arts is not a crime. He said it is the policy of the United Nations to respect the right of privacy. He said, with emphasis, that anyone who violates privacy with respect to support for the arts will be broken back to a G-7 clerk."

She was staring at him in growing disbelief. "He said to forget it. That's what you're telling me."

"He said nothing of the sort. Forget what?"

She opened her mouth. Thirty seconds later, words came out. In the interval, she examined her life, for the first time in decades. "I forget," she said at last.

He nodded. "Elephants never look happy."

She powered her chair back to her desk, looked at it, drummed her fingers on it. "The story *will* come out," she said finally. "Artists always talk to cronkites. Sooner or later one will listen, and realize he has actual news on his hands. The data are public information."

"They will be when we release them," the Undersecretary agreed carefully.

She did mental arithmetic, checking a few figures with her desk. "George, this is scary. *Whoever* is doing this, they're spending themselves broke. At the present rate of outlay, any conceivable candidate donor will be bankrupt in about five years."

George nodded. "That's the figure I arrived at. But there are signs that the rate is increasing."

"My God! George, you know better than I: a fluctuation of this magnitude in the global economy simply has to translate into suffering and misery, sooner or later. Doesn't the Secretary *see—?*"

"I'll tell you what I wish," he said.

"What?"

His voice was wistful. "I wish I had kept up the guitar."

CHAPTER 19
Provincetown, Massachusetts
24 February 2065

Rhea opened the front door wide. "Goodnight, Tommy," she said politely, and hurled him through the door and clear off the front porch. Tom Cunha landed well, and turned back to her with a baffled expression. She tossed the plastic bag of fresh codfish he had brought her after him, scoring a direct hit on his head. "Not tonight," she said. "I have a haddock." She cackled with laughter and slammed the door on him.

The laugh didn't last long; she was too angry. And then the anger too failed her, and she was back to sad. Her shoulders slumped; she turned and headed wearily for the kitchen.

Two weeks to the day since Rand had gone back up to the Shimizu—for good, he said, and she believed him. Fourteen days since her marriage had

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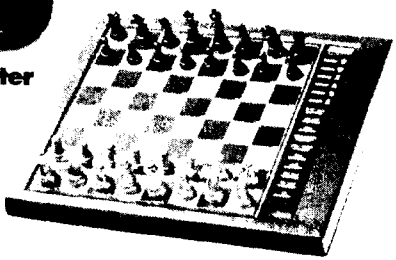

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officially ended. Half a Moon of loneliness and celibacy. Provincetown was a small town, its jungle drums especially efficient in winter; the unaffiliated were already beginning to sniff around. P-town being P-town, no more than half of them were male, Rhea's own preference. But god damn it, couldn't *one* of the oafs approach the business with any *class?* She wasn't asking for love, or even strong affection. Given the least salve for her pride, she might have relished a chance to lose herself in simple sweaty exercise. Instead she got fresh codfish and jovial offers to "take her off the hook."

Soon the global literary grapevine would catch up . . . and then the offers would be even more offensive.

A whole planet of men to choose from, and she didn't know one she'd swap for another night with Rand.

Or Duncan, for that matter. As she passed through the living room on her way to the kitchen, her eye fell on Driftglass, tumbling slowly end over end beside the bay window, balanced on an air-jet at head height. She had placed the vacuum sculpture there, defiantly, the day after Rand had gone back to orbit—right beside the spot where the family-portrait holo of the three of them stood. She stopped and contemplated it now. It seemed to belong there, next to the bay view, among all the old photos and momentos of Paixao history, looked to be a true part of Provincetown.

And all at once that irritated her. It was *not* of Provincetown. It was of space. It did *not* belong in that living room. The symbolism was wrong, it clashed. Things in Provincetown did not turn end over end in midair, defying gravity. Nothing in Provincetown was formed by vacuum except the town government. Space had not only taken her husband and her marriage, it had sent a tentacle down into her very own living room here on Earth. And made her like it. It had seduced her the same way it had Rand . . . with beauty. She could never, would never, go back . . . but she would never again fully leave space behind. A piece of her heart was caught there.

All right: if even her childhood home wasn't safe, there was always the shore. There was nothing of space there. She reversed direction and headed for the door. No sense going to the kitchen anyway; she hadn't been able to choke down a bite in days.

She paused on the porch, to make sure both that Tommy was gone and that she had her smart clothes on, and then summoned the car. The bayside beach was less than a block away by foot . . . but the ocean beach on the north side of town would be windier, and thus less populated now that the sunset was long over.

As the seat harness enfolded her, she noticed that the passenger seat beside her was still set to Rand's dimensions. With a sharp gesture, she randomized it again. On second thought, she adjusted it to Colly's shape, and randomized the back seat. Time for the kid to start sitting up front. "Herring Cove, public lot, via Commercial Street," she said, and the car moved forward at the local maxi-

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mum of 20 KPH.

The four days of Rand's visit had been agony. The first day was Colly's birthday, and both parents were invincibly cheerful, maintaining the truce even when Colly wasn't around for fear of shattering it. That was bad, but it was worse when they began talking on the second day. It took them two more days, progressively worse through exhaustion, before both were willing to concede that there was nothing to say, nothing to be done. Rand was staying in space; she was staying on Terra; no compromise existed. Once they had admitted that, they'd made love one last time, ceremonially. Rhea had never made love in despair before. She did not quite regret it in retrospect . . . but she wished she could stop remembering it for awhile.

Perhaps oddly, Duncan's name had not come up even once. She would always remember him fondly, had interceded with the Shimizu to save his job—but she and Rand both knew he had only been a symptom, an excuse, a way out of a dilemma she had not been consciously willing to resolve. And in any case, that relationship was over: Duncan was, by birth, just as committed to space as Rand intended to become.

She phoned Tia Marguerite on her way to the ocean, and was told that Colly was fine, Tia Marion was just giving her a bath, don't you worry about a thing, dear. She cut the connection, and worried.

It had been two weeks. She could not stall forever. Sooner or later she was going to have a long talk with Colly, and try to explain the change that had come into both of their lives. Colly knew that she and Mommy were going to be living on Earth again for awhile—but had not been explicitly told why, or for how long. She did not yet know that Daddy's visit Earthside had been his last. The longer Rhea waited, the harder it would be. But the wordsmith had not yet found the words she needed. Or perhaps it was courage that eluded her.

Commercial Street was a single one-way lane along the waterfront, not much wider than her car. Her progress was sporadic: in compliance with local statute, her car braked for all pedestrians and pets. On either side of her as she drove were a parade of temptations, bar after lounge after club after bistro, each as inviting as human ingenuity could make it, overflowing with the light and warmth and sounds of convivial merriment. She shuddered at the thought of entering one. She began to regret choosing this route—but it did keep her within smelling distance of the shore the whole way, and that was worth the aggravation of being surrounded by people and their damned gaiety. She was glad when she passed the rotary and breakwater by the Provincetown Inn, and left town behind. The car speeded up, and soon her headlights showed only dunes and marshgrass and rosehip and blueberry bushes.

She switched on her clothes, and by the time the car parked itself at Herring Cove they had warmed up. She set out at once into the teeth of

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the wind, leaving her face unlit to indicate that she did not welcome company. She walked along the shore, feeling her way in almost total darkness, until she found a private semicircle of dune, and crept deep into its pool of shadow. It was too overcast to really see the ocean, but the sound of the surf overpowered and calmed her thoughts, and the shore-smell sank into her bones. She lay on her back in the sand, and dialed down her clothes until she could feel some of its coolness.

She was very near to something like peace when, an hour later, the overcast blew away—and the stars came out.

Even here, most of the world was space. The only difference between the view here and that from any window in the upper hemisphere of the Shimizu was that here she was under one gravity and here there was not even a layer of glassite between her and all that emptiness....

No, there was another difference. Rhea had *always* loved the stars. And this beach had always been one of her favorite places from which to view them. Now, as the wind whipped over her, she was forced to admit that they were prettier without atmosphere in the way. In space the stars did not twinkle or shimmer, just burned steadily down forever. There was a better perception of depth, of scale, there. And the distinction astronomers made—blue star, yellow star, red giant—in space you could actually see them.

Oh, if only the stars could be seen that way without sealing yourself up in a claustrophobic little can!

Or hiring a good shaper....

She found herself clutching at the sand on either side of her, and sat abruptly. As soon as she did, she realized she would not have this stretch of beach to herself much longer. Something over a dozen people were coming her way along the shoreline, faces glowing softly like jack-o'-lanterns. Unusually, they did not seem to be chattering, did not seem to have fetched any kegs or food or instruments or collected any driftwood for a fire. For a moment, instinct made the hairs rise on the back of her neck—but there had not been any serious crime in Provincetown in decades. She watched them approach, hoping they would pass by and keep going.

To her disappointment, they stopped not far away. She stiffened when she saw them form a circle. Trancers! Just what she needed now: dance imagery against the backdrop of the stars. Worse: Trance-dance—as close to zero-*g* dance as you could find on Earth, in spirit and in phrasing. She got up, had her clothes repel the moist sand that wanted to cling to her back, and headed back to her car, giving the Trancers as wide a berth as the terrain permitted.

Nonetheless, one of them left the group and approached her, just as the first dancer was getting under way in the center of the circle. She started to speed up to avoid him—but slowed and then stopped as she recognized him. Manuel Brava.

He pronounced his name in the old Portagee way, "M'nal." He was a local

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character, even in a region rich with colorful eccentrics. There was no telling his age; Rhea did not know anyone in town of any age who didn't have childhood memories of him. Nor did anyone know how he made his living. One saw him from time to time, usually in stillness: sitting motionless by the shore of the ocean beach, or on a pier on the bay side, staring out to sea and smiling faintly. He was sort of the Cape Cod equivalent of the wandering Hindu holy man, who lived simply and said little and was fed by all he passed. In return he would give single, short sentences, which were never overheard by anyone but the recipient. People were reluctant to discuss whatever it was Manuel had told them, but the consensus was that he was a smart old bird.

In Rhea's own case, she had wandered past him one day in her sixteenth year with an extra cheese sandwich . . . and in return for it had been told, "When you're alone . . . you're in pretty good company." It had meant little to her at the time, but she had never forgotten the comment, and over the ensuing years it had come to seem wiser and wiser.

At sixteen, being alone had been her greatest fear, and the root of it was exactly as Manuel had diagnosed: a failure to treasure herself. Manuel's casual, offhand comment might as well have been the final sentence of a full day's conversation between them. He had known her, without her knowledge, before she'd ever said a word to him. He seemed to know everyone in town that well; at least, he never seemed to need a second sentence.

Why that wasn't creepy was that what he had said, after studying her well, was something kind. Good return on a cheese sandwich.

As he approached, now, there was no doubt in her mind that he knew all about the recent upheaval in her life; she waited for her nugget, wishing she had a sandwich on her. God knew she could use a little insight just now.

He stopped beside her and turned so that they both faced the sea and the Trancers. They watched them together for a timeless time. Shortly she forgot that she was waiting for him to speak. Trance-dance lived up to its name: there was something elementally hypnotic about it. There was something otherworldly about it, too: in some subtle way she could not pin down, the Trancers reminded her of Stardancers. Perhaps it was only the rosy glow of their illuminated faces against the black sea and sky. Their dance did not seem to require any great skill, yet it held her spellbound. For the first time she began to understand why one would want to spend so many hours doing that.

"Be ready," Manuel said. "It's gonna be good."

She turned to look at him, and he was smiling. Her first reaction was to ask, what is going to be good? And when? But Manuel never explained, never amplified. So she was surprised when she heard herself ask, "Will I know when it's coming?"

His smile broadened. "You won't miss it."

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Two sentences was a record. She decided to go for broke, and ask him *how* to be ready—but he was already shuffling back through the sand toward the Trancers. She watched in silence until he joined in the dance. Then she turned and trudged away to her car.

Halfway there she stopped . . . stood for a moment . . . then turned and retraced her steps. She stood at the fringe of the dance for perhaps half an hour before joining it. When she did, it welcomed her.

She returned to linear consciousness in the car, on the way home. Her watchfinger said it was a little after four in the morning. She did not feel as tired as she should have; somehow the dance had given more energy than it had taken. She felt as though if she were to unseal her seat harness, she might float up to the ceiling.

In addition, there was an odd, almost forgotten sensation deep within her. She was hungry. . . .

She entered the house at a dead run, and ate nearly half a loaf of *massa cevada*, Portuguese sweet bread, slathered with butter, washing it down with pirate-strength black tea. When she was done, she made and kneaded a vast batch of bread dough for *malassadas*. The fried sugarcoated treats—a Portuguese version of beignets, known locally as "flippers"—were Colly's favorite breakfast.

While the dough was rising, she went upstairs and outside onto the roof, to watch the Sun rise from the widow's walk. It was one of the few authentic widow's walks left in Provincetown; five generations of Paixao women had paced these very boards, scanning the horizon for signs of their returning husbands. Every time they had been successful, too, eventually; none of the Paixao men had been lost at sea—which probably made this the luckiest widow's walk anywhere. Rhea was conscious that she was breaking the string of good luck, and it brought a pang—but as the colors began to take form on the horizon, she decided it was one she could endure.

Most of the boats had gone out long since, but one unfortunate captain with a cranky engine was just putting out from MacMillan Wharf, warping around the breakwater. A delivery truck was clattering down Commercial Street, and gulls were harassing the garbage collectors. From her high eyrie, Rhea could see the silhouette of a lone figure walking along the shore, beachcombing.

That Trance-dance had been her first extended break from pain in many weeks. No, not from pain, but from the suffering of it. At no time had she lost a preconscious awareness of her emotionally damaged condition . . . but she had relaxed to it, ceased to fear it. She believed now that she was healing—even if she had no idea how long the process would take. And she knew she would be returning to the ocean shore to join more Trance-dances. Perhaps Colly might enjoy it too; Rhea had seen children at daytime Trance-dances, and it was something they could share. . . .

Just as there was enough light for

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her to make out Tia Marguerite and Tia Marion's house, a few blocks distant, she saw a light go on in the room where Colly would have slept. She went back downstairs and punched down the *malassada* dough. She cut it into pieces, stretched them a little, and set them aside. Then she called Colly, making sure to tell Boswell not to wake her guardians if she failed to answer.

But she did answer, at once. "Hi, Mom!"

"Hi, honey. Are you having a good time?"

"Sure!"

The enthusiasm was plainly counterfeit; Rhea was recovered enough to hear that now. Colly loved her great aunts—but knew perfectly well that she only slept under their roof when she was being left out of something. "Well, I don't want to spoil any big plans or anything, but if you're not here in ten minutes, the flippers won't be hot when you eat them."

"Flippers? Home-made? Wow! Quick: open the door so I don't break it." She hung up—and was in the kitchen before the oil was hot. They made the *malassadas* together, giggling, and gorged themselves until they creaked.

And then they had a long, long talk.

CHAPTER 20
Top Step
25 February 2064

Rand hung suspended like a fly in black amber at the precise center of the Universe, tethered to a mountain. The only sounds were the oceanic ebb and flow of his own breath, and the persistent slow drumming of his pulse. All creation was arrayed around him. He felt an impulse to put himself into a spin, so that he could see all of it, but knew that he would foul his umbilical if he did. Probably just as well; even half of infinity was a lot to take in at once.

He found himself thinking of a poem Salieri had retrieved for him last night. He had asked for "something with Fireflies in it," and the AI's search engine had yielded up a *hauta,* a species of Japanese folk song more elaborate than the more common *dodoitsu:*

Kaäi, kaäi to
Naku mushi yori mo
Nakanu hotaru ga
Mi wo kogasu.
Nanno ingwa dé
Jitsu naki hito ni
Shin wo akashité—
Aa kuyashi!

(Numberless insects there are that
call from dawn to evening,
Crying, "I love! I love!"—but the Firefly's silent passion,
Making its body burn, is deeper than
all their longing.
Even such is my love . . . yet I cannot
think through what Karma
I opened my heart—alas!—to a being
not sincere.)

The truly remarkable thing was that the *hauta* had been transcribed and translated into English by Lafcadio Hearn in 1927—seventy years before "Firefly" meant anything but a species of insect. Yet it seemed to fit Rand's situation with eerie accuracy.

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The Fireflies had *created* humanity, seeding Terra with life millions of years ago and moving on. The Fireflies were of space. They had returned here the instant man began making art in space. Surely, then, space was where a human artist should go—even if love called him back to Earth.

Space didn't solve your problems . . . but it sure put them into a larger perspective.

"All right, people," Thecla said in his earphones, "Time's up. Precess."

Rand turned with the rest of the class, until they all faced the hollow mountain they had come from: Top Step, the place where humans came to become Stardancers. He was a little self-conscious; he knew he did not really belong here with these Novices. They were second-month students, only another month away from renouncing their former lives forever and accepting Symbiosis. Being among them made him feel a little like a tourist on Death Row, or an infidel smuggled into Mecca. But Reb Hawkins himself had suggested that he join this class.

Rand already had his "space legs," could handle himself in free fall—but all his experience was indoors, inside pressurized cubics. Everyone said that to really *feel* space, it was necessary to spend a lot of hours EVA. Shimizu was equipped to take guests EVA if they wished—but strictly as tourists, carefully shepherded and pampered, in permanently tethered suits with no thrusters at all and so much radiation shielding that mobility was severely limited, for a maximum of half an hour. Groundhogs were just too good at getting themselves killed outdoors. Spacers all laughed at anyone whose only EVA hours were in Hotel Suits—but more advanced training was not offered in-house.

When he'd met Reb Hawkins, he'd found himself telling Reb his problem, and the monk had invited him to visit Top Step and join a Suit Class. "But won't your students resent an outsider?" he'd asked.

"There'll be no reason for them to know you are one," Reb said. "Top Step is a big place now, and we have a strong custom of privacy going back half a century. If you show up in a class one day, people will just assume you've transferred in for some reason, and leave you alone. Most of them will be in the middle of life-reviews of their own."

Rand had thanked him—but still felt uneasy about the idea, and put it out of his mind.

Until his marriage had self-destructed.

When both Jay and Eva had suggested, within hours of each other, that he take Reb up on his invitation to visit Top Step, Rand had shrugged and agreed. He and Rhea had agreed that there was nothing a counselor could do to help them—but now that the plug had been pulled, he found that he needed to talk to *someone*. And a legendary holy man who made his home in space didn't sound like a bad choice. Rand had liked Reb at once when they'd met, and Jay and Eva vouched for him, "punched his ticket," as Eva called it.

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And now, as he rotated in space and faced Top Step—an immense stone cigar, glowing softly at the tip—he had to admit that coming here had been a good idea. Talking with Reb had helped: Reb's end of the conversation had consisted entirely of questions, just the right questions. Taking class had helped: it was hard to sustain self-pity out in naked space. And being around Postulants and Novices and Symbiotics had helped, too: all these people were in the process of saying goodbye to their lives, and their company helped reconcile Rand to living his own.

"All right," Thecla said, "we're going to try something new, today: you're all going back in on your own power."

There was a buzz of excitement, but it cut off quickly. Nobody wanted to louse this up.

"One at a time," she added. "I don't want you unsnapping until the person before you has made it all the way inboard. Abadhi, you're first."

One of the two dozen-odd p-suited figures in Rand's field of vision tapped his umbilical join. The tether separated, and Top Step began reeling it in. He oriented himself, starfished, and waited.

"Go ahead."

There was no visible exhaust from Abadhi's thrusters, but slowly he began to move toward Top Step. Very slowly. The trick in EVA maneuvering was to go about half as fast as you thought you should—then you only arrived about twice as hard and fast as you wanted.

At such speeds, covering ten thousand meters takes some time. Porter came far down the alphabet. Rand had plenty of time to study his classmates as he waited for his turn.

He had lost a marriage: these people were surrendering *everything.* They were more committed to space than he would ever be, and they were giving up more to be there.

And in return they would gain so much that part of him envied them. Centuries of life, life free of fear or hunger or loneliness, in the bosom of the largest and closest family that had ever been, working and playing among the stars. Those of them who were artists could spend the next century or two pursuing their art, twenty-four hours a day if they chose, with no need to seek commercial or popular or critical success. Or to look for love.

Maybe someday, he thought. *Maybe in another ten or twenty years, I'll come back here for real.*

The thought came back, *why not now?*

He was not done yet, that was all. Married or not, he was still a parent, and would be for at least another decade. He had not used up his visions yet; he still had shapings to create which would not have worked in a Stardancer context. He had still not outgrown his need for applause, his need to achieve. He had fought for his present position so long and so hard that he could not abandon the cup until he had drained it dry. It had, after all, cost him a good wife.

"Porter—get ready!"

He snapped out of his reverie and ran through the procedure in his

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mind. *This* sequence of commands tells the tether to go home; *that* combination of taps on the palm keypads will deliver matched bursts from all five thrusters; move my chin like *this* for the heads-up targeting display.... "Ready, Thecla."

"Go."

His tether wiggled away toward Top Step. He centered the target ring in his display, stiffened his limbs, and triggered the thrusters. Aside from a mild pressure at wrists and ankles, nothing seemed to happen. The thrusters at the base of his spine produced no sensation at all. Could it be broken? No, his display claimed he was jaunting just as planned. He glanced around, and saw that the others were indeed receding, just quickly enough to perceive. He waited—and after awhile, Top Step suddenly began to visibly approach. He checked his position carefully, decided he needed a course correction, and made it.

His aim was good: if the vast open window of the Solarium had had a bull's-eye, he would have hit it on his way through. His deceleration was equally perfect: he ended up motionless within arm's reach of the handgrip he had been aiming for. He saw admiring glances from other returnees, and preened. "Very nice," Thecla said. "OK, Pribram: get ready!"

His AI, Salieri, whispered in his ear. "Phone, Rand. Reb Hawkins."

He cut off his suit radio and took the call. "Hi, Reb."

"Hello, Rand. Are you enjoying EVA?"

"A lot!" he said. "Thanks for letting me sit in. It's *different* outside."

"It certainly is. Listen, I just wanted to tell you I'm not gong to be around for the next couple of days. I have to shuttle over to the Shimizu."

"Really? What's up?"

"A party, of sorts. You're invited if you want, actually—if you don't mind taking a couple of days off from EVA classes, you could hop over and back with me. It should be a memorable event."

"What's the occasion?"

"You know Fat Humphrey?"

"Who doesn't?" The round restauranteur had been famous ever since the release of Armstead's Starseed Transmission at the turn of the century; it was said that his Le Puis rivaled the Tent of Lucullus as a gourmet's and gourmand's paradise. Armstead claimed that you never had to tell Humphrey what you wanted to eat, how you wanted it done, or how much you felt like eating. Over the past week, Rand had found that to be the literal truth.

"Well, he just turned one hundred ... and he's retiring to the Shimizu to enjoy his golden years."

"Wow. That's going to disappoint a lot of folks."

"Yes, it will. He's been swearing for decades that he was going to retire the day his age showed three figures, and it seems he meant it. Last night after dinner he took off his tux and spaced the thing. The chefs and staff are all people he trained, of course—but it just won't be the same without him sizing up the customers and serving the orders. Fat sweetens

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the air where he is. Anyway, he won't let us have a farewell party for him here, prefers to just leave like a cat—so Meiya and I are bringing him over to the Shimizu tonight in a special shuttle. There's room for you if you want to come along."

"Sounds good," he said. "I'd like a chance to get to know Fat half as well as he knows me. Every time he pulls that magic act of his, I can't help wondering what *he* likes to eat."

Reb's answer was a moment in coming. "Do you know . . . in almost fifty years, I don't believe I've ever *seen* Fat eat?"

"He must do it some time," Rand said dryly. Fat Humphrey massed well over a hundred and forty kilos; in repose he resembled a Jell-O model of the Shimizu.

"True enough. Well, maybe we'll get to see him in action when we get him to the hotel."

"I'll take him to Lucullus's Tent tomorrow," Rand said. "It would be an honor to buy Fat Humphrey a meal. And you and Meiya."

"Done," Reb said. "Meet us at the dock at 1700." He broke the connection. Reb never seemed to be in a hurry—but he never wasted time or words either.

The last of the students had returned inboard; Rand turned his radio back on in time to hear Thecla dismiss the class. He left the Solarium, and with Salieri's help found his way through the maze of tunnels that honeycombed Top Step to the room he'd been assigned. There he took off his airtanks and thrusters and set both to recharging, and packed a small overnight bag. He was not yet ready to return to the Shimizu full-time, but a day or two couldn't hurt. It might be instructive to test the strength of the scab Top Step had begun to form over the deep wound in his heart.

And he could check in with Jay, see how the new piece was going. He hadn't produced a note of music yet, hadn't even viewed the working tapes Jay sent every day, but Jay would understand. Rand had left him a perfectly good shaping to use—the New Mexico desert setting he'd already had in the can—and Jay knew his brother was perfectly capable of showing up a week or two before curtain and producing an acceptable score for whatever choreography he came up with. This retreat had been Jay's idea as much as anybody's.

A thought struck him as he packed. "Salieri—can you determine relative locations for Colly and Rhea?"

"Boswell indicates they are approximately fifty meters apart, Rand."

"Good. Get me Colly on a hush-circuit."

"Hi, Daddy! What's up?" Colly's cheerful voice asked a few seconds later.

"Hi, princess. I just wanted to let you know I'm going back to the Shimizu for a couple of days. I know we were scheduled for a long chat tonight, but it looks like I'm going to be too busy. Can we reschedule for Thursday?"

"Sure. I guess. . . ."

"Problem?"

The answer was awhile in coming. "Dad?"

"Yes?"

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"I . . . uh . . . Mom and I had a talk this morning."

"Oh." The first sensation he was conscious of was a large weight leaving his shoulders. He had not relished the prospect of explaining things to Colly—but it hadn't looked as if Rhea was ever going to get off the dime. He was enormously relieved to learn that she had.

But, only half the weight was gone. "Are you . . . OK with that?"

Again the answer was agonizingly slow in arriving. "Can I ask you something? I asked Mom, but she said she didn't know, and I should ask you."

He took a deep breath, and held it. "Go ahead, honey."

"What's the most time I can spend up there with you?"

He exhaled noisily. There was a sound in his ears like bad reception on a suit radio, a sort of vast echoing hum. "Without adapting, you mean."

"No, I found that out from the Mad Hatter," she said. "I mean, without being a pain in the butt."

His heart turned over in his chest. "The max, baby. The max. And if that isn't enough to suit us both, I'll come down there and see you sometimes. Until I adapt, anyway."

"That's good," she said firmly. "Uh . . . can I ask you one more thing?"

"Sure."

"Are you still mad at Duncan, Daddy?"

The question was like a surprise punch in the stomach. He took it, and shook his head, and answered honestly. "No, Colly. I'm not mad at Duncan."

"I'm glad. Tell him I said hi. Bye, Daddy—I love you!"

"What an extraordinary coincidence: *I* love *you.*"

"What are the odds of that, huh?" She hung up smiling.

Rand finished packing. Then, with time to kill before he was due at the dock, he played some of Jay's tapes, and tinkered with ideas for musical accompaniment. Hell, maybe he should stay at the Shimizu when he got there, and get back to work. Maybe it was time to resume his life. He could play around with EVA another time, when there wasn't so much to do. He thought of calling Jay, to tell him he was coming. But the timing was bad: Jay would be in the studio now. He decided to call when he got in.

The trip to Shimizu was thoroughly enjoyable, despite the spartan furnishings aboard the small shuttle. Fat Humphrey in a p-suit was an unforgettable sight, for one thing. And as a traveling companion, he was the original barrel of monkeys; while they were all unstrapped between acceleration and deceleration he even managed to produce a recognizable parody of *Kinergy* that reduced Rand and everyone else aboard to tears of laughter.

Rand was honored to be included in the merriment. It was apparent to him that this trip was a sentimental journey for Reb—and for Meiya, Reb's successor as Head Teacher at Top Step. While they had been training and graduating a quarter of a million Stardancers together over the

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past half century, Fat Humphrey had been one of the very few constants in their lives. Meiya, a quiet, solemn woman, wore an expression that reminded Rand of old pictures he had seen of mothers sending their sons off to war.

As he watched Fat Humphrey mock the moves of a Stardancer, he suddenly wondered why Fat had not accepted Symbiosis on retirement. But he knew he would not ask, not today anyway. The question was in an area of privacy you learned not to violate if you spent any time at Top Step: he didn't know Fat well enough yet.

And the man read his mind. The moment the laughter for his performance had died away, he looked at Rand and said, "You wonderin' how come I didn't eat the red Jell-O for my dessert, huh?"

"Well . . . yes, Fat, I was, as a matter of fact."

Fat Humphrey grinned. "You ever hear about the time them assholes blew up about a cubic mile of Sym?"

"Sure." Almost a decade before Rand's birth, a fanatic antiStardancer terrorist group, headed by Chen Ling Ho's father, had somehow managed to destroy a large mass of Symbiote on its way from its source in the upper atmosphere of Titan to Earth orbit, where it was supposed to serve the needs of the next generation of Top Step graduates. Several Stardancers riding herd on the load had been killed.

"Well, most o' that was suppose' to be for me. They been tryin' to catch up ever since, but it's gonna be another twenty years or so before they ready to handle me again." Rand cracked up; so did Reb and Meiya. "I figure in the meantime I watch a little TV, go for a swim, catch a show. You get me a good seat?"

"Well, I'll tell you, Fat," he said thoughtfully, "in terms of sightlines and vectors, maybe what we should do is mount a special show just for you."

"How do you mean?"

"Put you in the center of the theater, and work around you."

Fat roared with glee and slapped him on the back; fortunately his seatbelt held. "You're all right, kid."

They reached Shimizu by 1930. The deceleration was as mild as the acceleration had been, no more than half a *g*, and for only a few minutes. Rand could have taken more easily, but the others were all spacers, intolerant of high *g*'s.

Fat Humphrey had specifically requested that there be no reception on his arrival. Of course Evelyn Martin had doublecrossed him, and was waiting at dockside to drag him off to a press conference. But Rand had halfway expected that: he debarked first, took Martin aside, and threatened to take him by the testicles and fling him through the nearest bulkhead into hard vacuum if he didn't change orbits, now. Grumbling and muttering, the little PR man complied. It is difficult to slink in free fall, but he managed it. "Don't bother with check-in," he snarled over his shoulder as he went, "it's covered. Just take him right to P-427."

Rand rapped on the hatch to signal

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that it was safe, and the others emerged. As nanobots scurried away with luggage, he tried to show Fat Humphrey where to insert the wafer that would install his AI in the Shimizu's data crystals . . . and was startled and a little nonplussed to learn that Fat did not have one.

"How about you, Meiya?" he tried.

But she shook her head, too. "I won't be inboard long enough to bother. We'll all use Reb's to get around."

"Well, OK," he said. "But stick close to him. This place can be a rabbit warren if you don't have an AI."

"There are public terminals all over, left over from the old days," she pointed out. "If I get lost, I can just ask for you."

"Sure. I'm not listed, but my AI is: Antonio Salieri. How about if I go get my brother and meet you all at Fat's new suite in about an hour? I'd like to grab a shower, too; I've been in this p-suit all day."

"Good with me," Fat Humphrey said.

"We'll meet you there in an hour," Reb said, and installed his own AI. "Rild—direct us to Suite Prime 427, please."

One of several exits began to blink softly. "This way, *Tenshin.*"

Rand jaunted to his own room, checked the time, and decided to phone Jay before showering. He would have just finished dinner by now.

"Hey, bro, what's shapin'? When are you coming back?"

"About five minutes ago. Want to meet the happiest fat man in human space?"

Jay blinked. "'. . . The happiest fat man. . . .' hey, you mean Fat Humphrey? Is *he* here?"

"To stay. He's just retired; it's his centennial. I came along for the ride; I'm going back with Reb tomorrow. Little gathering at his new digs in about an hour: just him, you, me, Reb, and Meiya, as far as I know. You know Meiya, right?"

"Sure. Hey, this is great! I've always wanted a chance to kick back and talk with Fat for a few hours. Where's he at?"

"Prime 427. Meet me at the nearest corner at 2025 and we'll go in together."

"See you there."

Fifty minutes later he was waiting at the appointed spot. Almost at once, Jay arrived from another direction, grinning. They hugged, and pounded each other's shoulder blades.

"How are you, bro?"

"Fine," Rand said. "I've gotten a *little* work done—I'll show you later."

"The hell with that—how *are* you?"

"OK," he said. "Not well, yet, but I can see daylight, you know?"

"That's good. I told you that place'd be good for you. Hey, Eva's gonna be here too: Reb called her. Probably in the suite already, in fact; I spoke with her half an hour ago and she said she was leaving right away. I get the idea she and Fat are old friends."

"It wouldn't surprise me in the—"

The lights went out.

"What the *fuck*—" Jay said. "Diaghilev!"

No answer.

"Diaghilev, goddamn it!"

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"Salieri?" Rand tried.

Silence.

There was a public terminal nearby, but it was unlit, presumed dead. "Jesus," Jay said softly, clearly controlling his voice with an obvious effort. "I think the whole fucking system is down. That's never happened. I'd have bet a billion dollars it couldn't possibly happen."

They heard a scream somewhere in the far distance; no telling even the direction. The Shimizu corridors had some funny accoustics.

Rand's heart hammered. "Oh my god. . . ." If they had no lights, no AIs, no phones—how long before they had no *air?* He fought for calm in the claustrophobic darkness. "All right, what's our move?"

Just then lights came on. Small red emergency lights, every hundred meters along the corridor, with larger blinking ones marking intersections. Rand found them an immense relief, a sign of recovery, but he saw Jay frowning. "They should have kicked on a *lot* sooner, even if this is a total system collapse," Jay said. "Something really weird is going on."

"Have we got air?"

Jay spotted the nearest grille, jaunted to it, and put his face near it. "Yeah. Reduced flow, but it's air."

"What do you think: is this just local, or is the whole damn hotel really dark right now?"

"Beats me. They're supposed to be equally impossible. I pray to God it's local."

A suite door opened not far from them, and someone stuck his head out. "Hey, mate," he called in an Aussie accent, "any idea what the bloody hell is goin' on?"

"Look at it this way," Jay called back. "You're getting tonight's rent free."

"Too right," he said, and closed his door again.

"God," Rand said. "Fat and the others must be freaking out in there. If they had the window closed when the power failed, they're in minimal emergency lighting: it could take them an hour to find the manual door release, let alone figure out how to use it."

"Hell of a welcome to the Shimizu," Jay agreed. "Come on, let's go try and calm them down."

They jaunted in the eerie pale red light to Suite 427. "We'll never convince Fat the place is safe now," Jay complained as they neared it. "Shit, I just don't *believe* this. The only thing I can imagine taking out the Shimizu system is a comet right through the core crystals—and we didn't feel any impact. It just doesn't . . . oh, you asshole." Automatically, he had stopped in front of the door and waited for an AI to ask his business. "Hit that release for me, will you, bro?" he said, pointing.

Rand pulled open the access hatch indicated and pulled the handle inside. It moved easily—but the door did not move. "Seems to be broken," he reported.

Jay grimaced. "Naturally. Things never go wrong one at a time." He put his hands on his hips. "Christ, the door's soundproof—we can't even bang out 'Calm down' in Morse code."

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"What's Morse code?" Rand asked.

"Eva would know, but it doesn't—wait a goddamn minute! What do you mean, 'broken'? That's a mechanical latch: it *can't* be broken."

"OK," Rand said agreeably. "Then what *does* nonfunction and a blinking red light mean?"

"A blinking—"

In free fall one almost never pales visibly; blood does not drain from the head as pressure drops. But even in the poor light, Rand could see his brother's expression come apart. He jaunted quickly to Rand's side and stared at the little flashing pilot bulb. After a few seconds, he began to shake his head slowly back and forth, the picture of denial.

Rand grabbed his shoulder, *hard,* and shook him. "What does it mean?" he cried.

Jay turned to him. There was horror in his eyes. He needed three tries to get the words out, and when he did, they were barely audible. "There is no pressure on the other side of that door." ■

To be Concluded in the Next Issue.

Galvani was mistaken about the amount of electricity in frogs, but he had some good ideas, too, for the galvanometer is named in his honor, and you don't have galvanometers named after you merely for making a mistake about a frog.

Will Cuppy

The world is so full of a number of things, I am sure we should all be as happy as kings, and you know how happy kings are.

James Thurber

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BIOLOG Jay Kay Klein

Jeanne Robinson, a European-descended Canadian citizen living in Vancouver, has the mindset of the original inhabitants of North America. She and Native Americans express themselves through dancing out stories. When Jeanne dances, she is telling a story and creating in her mind, and before spectators' eyes, a world of imagination that transcends the real world.

She was born in Boston, and raised there and on Cape Cod. Advanced education was at the Boston Conservatory as a dance major with a minor in drama. Her occupation has been dancer, singer, artistic director of a modern dance company, and a choreographer. She brings this background to her written story-telling in the famous collaborations with her husband, Spider Robinson. Together, they received both the Hugo and Nebula awards for their cover-story novelette in the March, 1977 *Analog*.

Spider's "Biolog" appeared in that issue, and now it's Jeanne's turn for the sequel. Other collaborations have been published in book form, and Jeanne has been honored as a writer at a multitude of festivals, university events, and SF conventions. As a writer, she puts into words what she otherwise expresses in motion to music. When dancing, like a Native American she can feel herself transported into another reality while carrying the audience with her. Shakespeare did this in the "wooden O" of the *Globe*, with poetry and a few actors on a bare platform. The action takes place in the minds of those who are onstage and those who are groundlings in the audience.

(Biolog continued on page 141)

Photo by Rand Gaynor

Jeanne Robinson

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Duncan Lunan

KEEP WATCHING THE SKIES!

Illustration by Sydney Jordan

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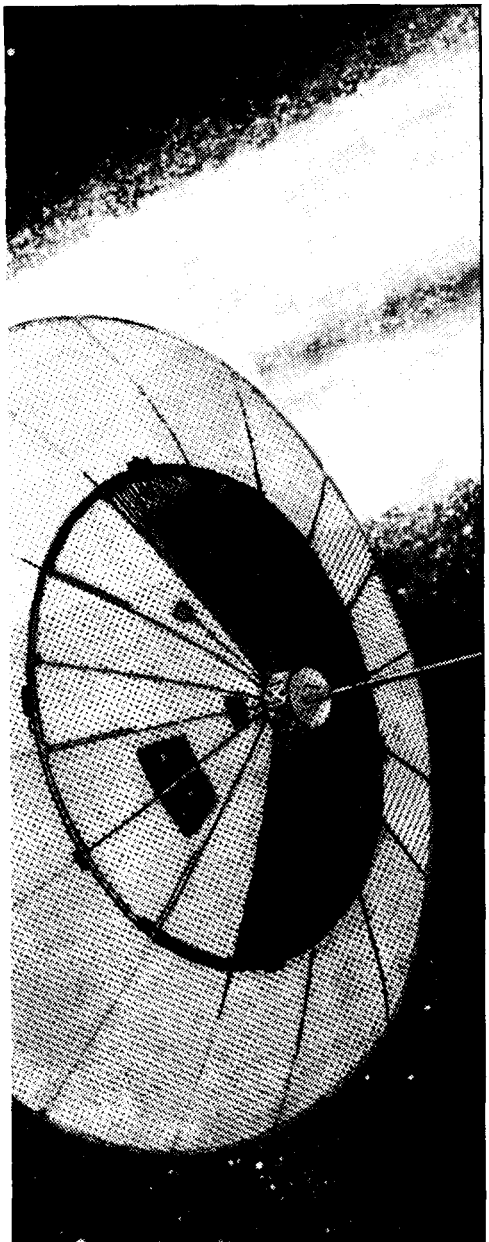

Comet Swift-Tuttle (1862 III) returned to the northern skies in late 1992. With the possibility that it might hit the Earth later, it made waves in amateur astronomy, professional astronomy, the media, the political sphere, and the military-industrial one; and it was interesting that the various groups seemed hardly to be talking to one another, much of the time. The whole debate about the need to protect the Earth was reopened.

Lewis Swift discovered 1862 III, the Great Comet of that year, on July 15th.[1] At first it was so like Schmidt's 1862 II that Swift didn't realize it was different, until Tuttle independently found it and announced it three days later. The astronomical world split the honors, hence "Comet Swift-Tuttle." In August 1862 the comet put on a spectacular display in northern hemisphere skies, traveling past Polaris from Camelopardis and developing a tail 25 degrees long (fig.1). In the telescope it was seen to be throwing out luminous jets which looped around the more normal tail in a most unusual way (fig.2). And when the orbit of the comet was calculated, it appeared to coincide with the Perseid meteor shower through which the Earth passes every August; the biggest display takes place between August 12th and 14th. The Swiss astronomer Plantamour lectured on the link with the Perseid meteors in the winter of 1871–72, mentioning that the Earth would next encounter the meteors on August 12th, 1872. The newspapers reported that the Earth would

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Figure 1

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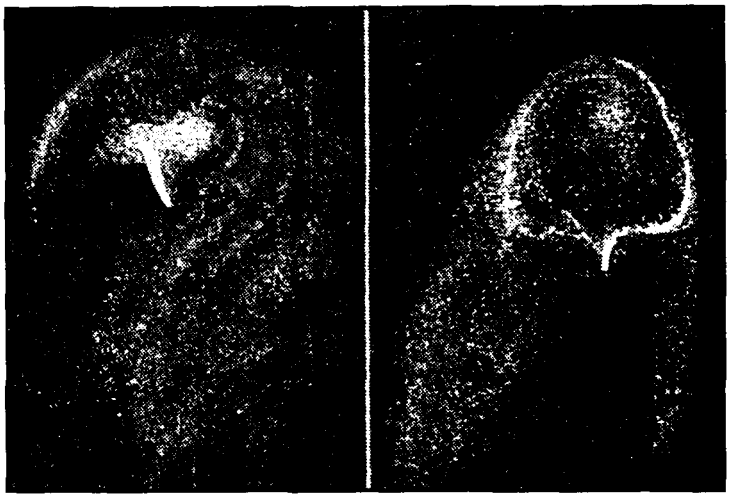
Figure 2



collide with the *comet* on that date, causing considerable public alarm.[2]

Nineteenth-century astronomers thought such fears were groundless. Comets had passed close to Mercury, and between the moons of Jupiter, without producing any noticeable perturbations; so their masses had to be low. And Earth had passed through the tail of the great comet of 1861 without any noticeable effect, so the tails had to be tenuous gases; and when the head of one passed in front of the star Arcturus without dimming it significantly, that seemed to clinch the matter—comets were entirely gaseous. In the 20th century it came to be accepted that there must be *something* inside the great heads of the comets, but whatever it was, no doubt it was too small and flimsy to be dangerous.

Science-fiction writers, of course, ignore the astronomers when it suits them. (E.g., for much of this century astronomers have believed this was the only planetary system in the Galaxy.) In *Hector Servadac* and its sequel, Jules Verne described a comet made of solid gold telluride, so that it could knock lumps off the Earth. H.G. Wells stuck to prevailing theory for *In the Days of the Comet*, in which there's no actual impact and the gases mix peacefully with the Earth's atmosphere. In Arthur C. Clarke's short story "Into the Comet," the core was a loose cluster of icebergs, giving off jets of methane and ammonia.

Clarke claimed to be quoting F.L. Whipple, but Whipple himself envisaged the "dirty ice" as a single mass typically 1-10 km in diameter[3]. I wrote a story, based on my own ama-

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teur observations of Comet Bennett in 1970, in which the nucleus was one loosely compacted mass of ice and rock, and Isaac Asimov said that "pictures a Whipple-like comet with considerable accurate detail"[4]. "Lucifer's Hammer," the comet which hits the Earth in the Niven-Pournelle novel, has a nucleus initially like the one in my story. Trying to visualize the impact, the characters use the analogy of "hot fudge sundae"—with the ice cream representing the "foamy ice," overall density considerably less than water, and embedded crushed nuts representing the rocks. But there's so much vaporization as the comet rounds the Sun that what approaches Earth is a boulder field embedded in gas, much like Clarke's description. We've all used the model which best fits the needs of our plots.

At the end of March 1992, the *Daily Telegraph* and the *Daily Star*—at opposite ends of the UK press spectrum—announced almost together that there was a chance Comet Swift-Tuttle would hit the Earth in August. According to the *Telegraph*, there would be no danger unless the comet went through perihelion (its closest point to the Sun) on August 12th, and the odds against that were given as two million to one. But as it says on the back of the novel, "The chances that *Lucifer's Hammer* would hit the Earth head-on were one in a million, then one in a thousand, then one in a hundred. And then. . . ."

The *Telegraph* gave as its source Dr. Brian Marsden, of the Harvard-Smithsonian Center for Astrophysics. Marsden and Yeomans, of the Jet Propulsion Laboratory, had independently recalculated the orbit and predicted perihelion passage in June or September 1981[5]. The problem was that the comet didn't seem to have any respectable antecedents. Giovanni Schiaparelli, better known for the first account of *canali* on Mars, calculated that the period of the orbit was 120 years and coincided with that of the meteors. Other 19th century estimates were 121.5 years[6] and 142 years[7]. But on any of these, even allowing for planetary perturbations the historical record should contain bright August comets which were previous visits by Swift-Tuttle. Marsden didn't find such sightings: the best available correlation was with Kegler's Comet of 1737, which would give no threat to Earth in 1982. However, it would mean that the comet was being acted on by powerful non-gravitational forces, and it could return to perihelion in November *1992*, with a serious prospect of a collision one or two orbits later[8].

Nevertheless, the amateur observers were now aroused. Meteor studies are one of the many areas of astronomy still dependent on amateurs for detailed, labor-intensive work. From these are calculated the Zenith Hourly Rates for each year's shower, mapping its structure as the Earth passes through it. The Perseids's rates fell to five or ten per hour in the 1920s, then rose slowly as the century went on. In the 1970s rates rose to 80 or more (the 1977 shower was well observed) and in 1980 there was a 50% increase. In 1981 and '82 the

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rates appeared lower, but the Moon interfered with both. In 1983 there was no sharp rise, and if the 120-year period was roughly correct, the comet had probably passed on the far side of the Sun unobserved.

Marsden had made his 1992 prediction diffidently in 1973, and repeated it still more diffidently in July 1991. Just twelve days later, an unexpected peak in the Perseid meteors suggested something was about to happen; it was repeated in 1992; and on 26th September the comet was recovered by Tsuruhiko Kiuchi of Japan. Getting to grips with the inconsistencies in previous sightings of what *could* be the same comet, Marsden found himself facing the possibility of an impact in 2126. This comment appeared in the January 1993 *Sky & Telescope*, accompanied by a Don Davis cover showing the nucleus grazing the Earth's atmosphere at the terminator, with a sea of fire below as the dust grains on parallel tracks meet their end. Will the main body strike, or miss?

By late October '92, the press was saying that the chances of an impact in 2126 were only 1 in 400—no problem, though some of these same journalists had considered one in two million to be dangerous ten years before. Dr. Ken Russell, at the Anglo-Australian Telescope, was quoted as retorting "A chance of 1 in 400 is not small when you are talking about the extinction of the human race"[9], which seemed a bit much for an object now estimated to be around 5 km across. If composed mostly of ice, it would have perhaps one-fortieth of the mass of the object which wiped out the dinosaurs—now very strongly linked with an asteroid impact crater off the coast of Yucatan.

Both press reports of 1982 cited the Tunguska event of July 1908 as an example of what could happen. That explosion was in the multimegaton range, and threw enough dust into the upper atmosphere to produce spectacular sunsets for months. Yet no part of the object reached the ground: there were no impact craters, and trees remained standing at ground zero, though stripped of bark and branches, as they did at Hiroshima. The standard scientific view is that the object was a small comet which approached Earth unseen on the Sunward side: a loosely structured object would fragment when the mass of atmosphere between it and the ground was equal to its own mass, and then supposedly all the ice evaporated and its kinetic energy was dumped into the atmosphere as heat, simulating an explosion.

But the Tunguska object was about 3 km up and traveling at several km per second when it exploded. Could so much ice vaporize in a fraction of a second? The big thing about ice as a material is its recalcitrance. In the 1960s, the U.S. Coast Guard set out to destroy a small berg to see if they could keep hazards out of the shipping lanes: high explosives only blew chips off, and the incendiaries just glazed the surface without even altering the overall shape. The chastened Coast Guard admitted that to destroy bergs in a hurry, even nuclear weapons might be ineffective.

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Now, remember those jets of gas from Comet Swift-Tuttle? Sir John Herschel reported only 1[10], but Chacornac saw 13 jets over 17 days[11]. In 1978 Whipple announced a new analysis of comet rotations showing that in many cases only small areas of the nuclei were active. Computer modeling allowed the rotation rates to be determined—33 hours in the case of Swift-Tuttle[12]—and Chacornac proved to be nearer the mark. The best fit with the observations, modeled by Zdenek Sekanina at the Jet Propulsion Laboratory, indicated seven active areas on the nucleus, none of them large[13]. The rotation periods for comets ranged from four hours to five days, and implied that to hold together, the nuclei couldn't be loosely compacted but had to be frozen solid—the nucleus of Comet Giacobini-Zinner seems to be disc-shaped, with an equatorial radius eight times the polar one. If loosely structured, it would almost certainly come apart under solar heating, or atmosphere entry.

Until those astonishing tiles were invented for the space shuttle the only way to protect an incoming vehicle was by *ablation*—the surface layer of the heat shield vaporizing and carrying away the heat it's absorbed while the shockwave protects the material behind. Some materials achieve it naturally (Chinese re-entry capsules have shields of peanut fiber, and it turns out that Soviet ones were wooden all along). The *tektite* class of meteorites have been ablated into aerodynamic shapes; larger stones are often covered with ice after they fall, even if red-hot at first, proving that the interiors are still at very low temperatures. The Coast Guard was right: ice would ablate in fireball conditions. Arthur Kantrowitz and others have envisaged ice-filled rockets, energized by laser or electron beams from the ground; in March 1974, the idea featured on an *Analog* cover for a story by Jerry Pournelle. The same physics apply to an ice mass coming down through the atmosphere—even if it did break up when the sonic boom became trapped between it and the surface, if it remained intact down to three kilometers it would fragment into pieces much too large to vaporize before they struck the ground below.

In 1976, an international programme to photograph bright fireball meteors and locate where they fell, revealed that most fireball objects are much bigger than had been thought, yet very fragile, disintegrating high above the ground[14]. The largest one photographed was estimated to mass 200 tons, yet be so fragile that it would have crumbled under Earth-surface gravity. In his book "Messages from the Stars" Ian Ridpath suggested very plausibly that the Tunguska object was similar in composition—possibly a comet nucleus from which all the ice had been driven off[15].

This could be the nature of many of the "Earth-grazing" asteroids. Thirty-eight were known as of 1978, and more than 90 by now—all of them liable to hit the Earth, Moon or Venus within the next 100 million years. If many of them are fragile objects, less threatening than their 1–10 km diam-

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eters would imply, then the situation might not be too bad. On the other hand, if it is impacts which cause reversals in the Earth's magnetic field, as has been suggested in some quarters, then the average interval between events big enough to do serious damage is 170,000 years, and we may count ourselves lucky as a species that there hasn't been one for 700,000 years. And on the other hand again—or is it the same hand?—it's been argued that as ice sublimes off, the comets may form a protective crust of dust which can close over altogether, shielding a substantial mass of ice inside[13,16]. Halley's Comet, the only nucleus to have been photographed, seems to support that idea, and Earth-grazing asteroids masquerading as fluffy dust balls may actually be a great deal more dangerous.

Asteroid 1989-FC caused some stir when it passed the Earth at 450,000 miles in March 1989. In March 1990 the National Space Society Golden Gate Chapter's *Space-faring Gazette* reported that its orbit gave recurring encounters every 13 months and it would collide with either the Earth or the Moon within 30 to 40 years[17]. Its diameter was given as between 500 and 1000 feet, depending on its composition and reflectivity. A dark, large, but loosely structured object would probably explode above ground without forming a crater, like the Tunguska one. 1989-FC had no cometary head and *presumably* isn't icy, but see above. But if the object is of rock or metal, with ten times the mass of a similarly sized iceberg, then the crater size could be 10 miles or more, equivalent to the impact of an average-sized comet nucleus.

There was no international response to the threat described in the *Gazette* report. Through the editors, and through press contacts in Australia, I exchanged letters with a number of experts, none of whom regard the prediction as valid. Nevertheless, the American Institute of Aeronautics & Astronautics held a conference on countering impact threats, only two months after the *Gazette* article appeared.

The favored answer was that the incoming object can be diverted by exploding nuclear warheads beside it: the material vaporized acts like a crude rocket to thrust the comet or asteroid into a new trajectory[18]. But even passing objects are detected normally by the trails they made on photographic plates, not developed until after the event is over. Something coming towards the Earth would be still harder to detect, and if it came out of the Sun like the Tunguska object it could arrive unannounced. An asteroid coming straight at us wouldn't make a trail on a plate, even if it was developed in time—and even from the distance of the Moon, at average Earth-grazer velocities there would be less than four hours to impact. It won't show on Ballistic Missile Early Warning radar even then, because the computers are programmed to ignore objects at such distances (ever since the time in the 1960s when they picked up the rising Moon and announced World War Three); and if it passes through the

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NORAD radar fence, recording satellites passing over the spine of North America, that would be only by chance.

The chances that large numbers of missiles could be reprogrammed and launched with the required accuracy seem very low. There would after all be no capability for mid-course corrections. The other problem is that if the object were shattered the consequences of multiple impacts could be worse than the original prospect. To protect Earth adequately, longer-term provision is necessary.

In June 1980, NASA's Advisory Council suggested a "Space-watch" to compile a catalogue of all objects passing close to the Earth[19]. No government action followed, but watches for Earth-grazing objects were set up, first at Mr. Palomar under Elinor Helin, then by Gene and Carolyn Shoemaker of the U.S. Geological Survey, and later at the Anglo-Australian Telescope under Duncan Steel and Robert McNaught. In January 1992, NASA recommended to Congress setting up a "Spaceguard Survey" (name lifted from Arthur C. Clarke's *Rendezvous with Rama*), of six telescopes, to identify 90% of Earth-grazing hazards within a decade[20]. Towards the end of the year, NASA doubled its study funding for the project, which still left only a dozen people in the world working on the problem[21].

But with a comprehensive catalogue, dangerous objects could be intercepted at aphelion, their furthest point from the Sun, and deflected using neutron bombs. This scenario is associated with Dr. Edward Teller, "the father of the H-bomb," and with the "Star Wars" SDI researchers at the Lawrence Livermore National Laboratory, whom Dr. Teller has long supported. In a time of decreasing tensions between the great powers, and with funding for the Strategic Defence Initiative under threat, critics such as Louis Friedman of the Planetary Society suggested that concern over impacts was just a cover for getting nuclear weapons into space[22]. "A still more drastic nuclear proposal, not to deflect dangers but to detect them, was put forward by Arthur C. Clarke in early 1993. 'Project Excalibur' would explode a 1000-megaton device, on the far side of the Sun for Earth's sake, and flood the Solar System briefly with microwaves, allowing the identification by radar of everything more than three feet across within the orbit of Jupiter—except objects on the Earth-Sun line at the time. If you're going to break the Test Ban Treaty at all, for the sake of Earth's survival, perhaps there's no point in half measures.

"But as regards Teller's scenario, we don't even know the crustal composition of a typical comet nucleus. . . ."[36]

Comet Halley's is extremely dark, supporting the idea of dust build-up; but Sir Fred Hoyle and Prof. Chandra Wickramasinghe took it to be evidence of complex chemistry, building up a shell of complex, tar-like compounds. To confuse the issue still more, recent work suggests that debris reimpacting Comet Halley should prevent the buildup of any

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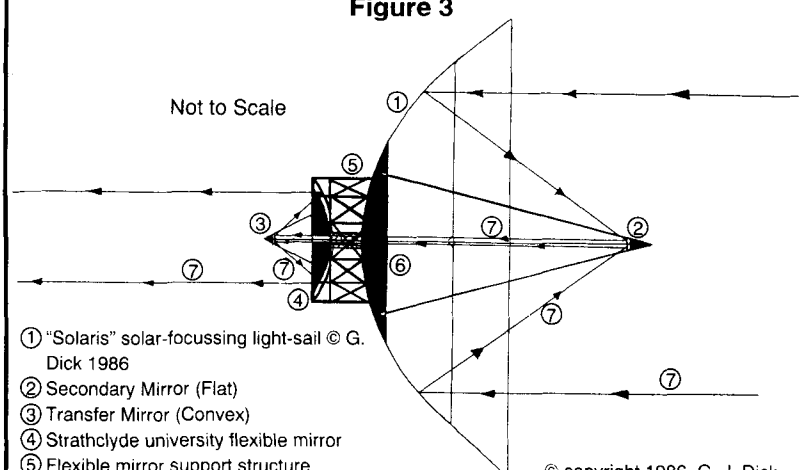
protective crust[23], and the "explosion" on the comet in December 1990[24] may have been such an event.

Then there's the rotation of the nucleus. In the case of Comet Encke, gas emissions are shortening the orbital period, but the pole of rotation has shifted through more than 100° over 191 years, and the effect of the emissions has been greatly reduced[25]. The effect of gases released by a nearby nuclear explosion will be very much related to the spin: it's not hard to imagine that on a fast-rotating nucleus the net thrust of a new jet might be zero, or much reduced, as seems to be the case with Comet Swift-Tuttle (see below).

But a technology "annexed" by SDI may provide the answer: a quick, relatively inexpensive, non-violent answer which breaks no international treaties and creates no political issues. The 'Comet-chaser' (fig.3), designed by Gordon Dick of Glasgow School of Art, could be effective much sooner than my own alternative to the nuclear weapon scenarios—industrializing the inner Solar System, so that any detected hazard could be reached by a task force and simply dismantled[26,27].

Gordon is an aerodynamicist and former sail-maker, winner of the Duke of Edinburgh's Award for the double-surface sail design which is now in competition use worldwide. The "Comet-chaser" he envisages

Figure 3


Not to Scale
① "Solaris" solar-focussing light-sail © G. Dick 1986
② Secondary Mirror (Flat)
③ Transfer Mirror (Convex)
④ Strathclyde university flexible mirror
⑤ Flexible mirror support structure
⑥ Solaris support and avionics superstructure
⑦ Incident and reflected solar ray

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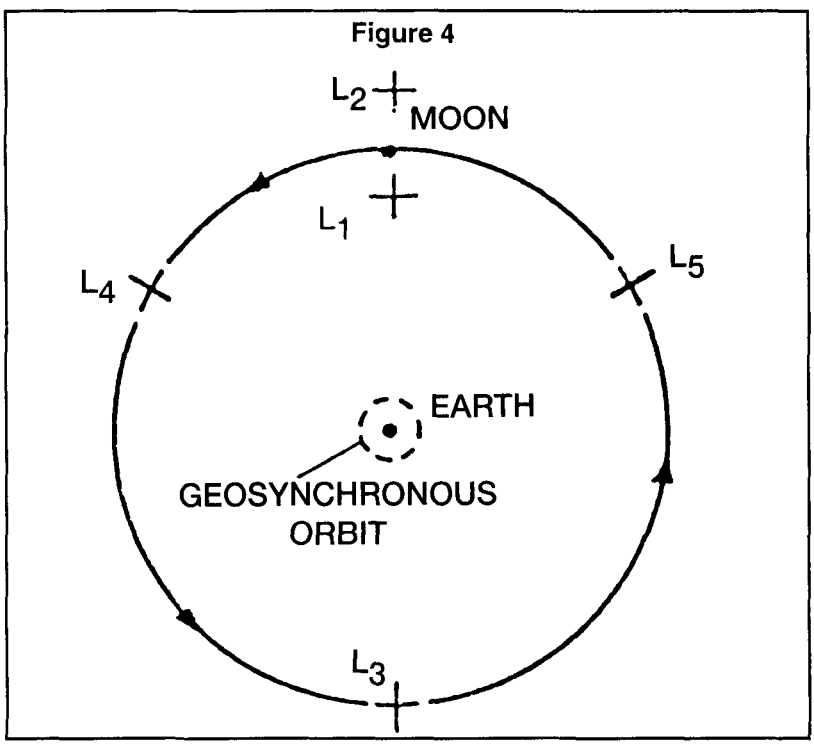
marries the "Solaris," his own design of parabolic solar-sail, with the flexible parabolic mirror created at Strathclyde University, by a team led by Dr. Peter Waddell. The University sold the patents to a U.S. aerospace company for "Star Wars" applications, and little has been heard of the flexible mirror since, but it may resolve the nuclear weapons/comets dilemma.

The Strathclyde mirror requires a pressure differential, which in space would be maintained by a layer of gas contained by a transparent, flexible membrane[28]. Other adaptive optic systems, developed meantime, include mirrors made of multiple segments, individually mounted and computer controlled [29], and very thin mirrors, mechanically adjusted from the rear[30]. Any of these could be used in the "Comet-chaser."

Three to five of these could be stationed at the Lagrange points of the Earth-Moon system (fig. 4), maintained in place by sunlight pressure alone[31]. Even in an emergency at least one should be able to detect and intercept an incoming comet by the



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time it reaches the orbit of the Moon, and burn a hole in its crust to release a gas jet which would deflect the comet past the Earth. At the distance of the Moon, the deflection required would be only one degree, or four thousand miles in space. For asteroids, more time would be required for deflection, but an interplanetary version of the sail would be able to cope with that given enough notice. And the more comprehensive the catalogue of Earth-grazers, the more likely that the Comet-chasers can get to a threatening object in time to turn it aside.

Once rendezvous has been achieved, the vehicle concentrates all the energy gathered by the sail into the optical system, and beams it from the quaternary, adjustable mirror to the optimum spot on the crust of the comet. While the beam goes down-Sun net thrust on the vehicle will be zero while it is in "burn mode," but a fifth, free-flying mirror would be needed to keep the beam focussed on the target spot as the nucleus rotates; if there's time, the first objective would be to slow the rotation to make it Sun-synchronous, so that the orbit-changing jet would be fully effective. The free-flyer would probably be needed even then, unless the hot spot is right at the sub-solar point on the stabilized nucleus. As the comet's orbit begins to change, the optical system will have to be de-focussed intermittently, to allow the sail to follow.

And if on further research the burn technique isn't going to work, if nuclear warheads have to be used, then at least the Comet-chaser can use passive propulsion to place them in exactly the right place.

The apparent threat of 1989-FC brought a brief surge of interest in Gordon's concept. A national newspaper provisionally commissioned an article, to emphasize that workers at Glasgow School of Art and the University of Strathclyde could have countered a great danger to the world, but dropped it when the specific threat could not be confirmed. *Space Policy* accepted a couple of letters from us on the subject[32,33]. With that endorsement, another Scottish newspaper provisionally took up the story—and then, paradoxically, Comet Swift-Tuttle came back and spoiled it.

On November 3rd '92, Donald Yeomans ruled out non-gravitational effects on the comet, accounted for the sightings in 1737, 1862 and 1992, and ruled out a collision in 2126. Now that the orbit had been charted with such accuracy, it seemed that the net effect of the jets was nil. (Which isn't to say that it will stay that way, as witness the behavior of Comet Encke and the 1990 explosion on Comet Halley.)

On December 12th, as the comet reached perihelion, Robert McNaught said that there was no longer a danger either for 2126 or 2291[9]. Even before the BBC's "Tomorrow's World" announced that there was no danger after all, the second newspaper had likewise lost interest, since their exclusive was now "only" the best way to counter incoming hazards. By March 24th, 1993, two high-

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ranking officials of the SDI Office and the Air Force Space Command had refused to appear before the House Science, Space and Technology subcommittee, because the Pentagon "didn't want to see headlines that the Air Force was chasing space rocks. The subject looked like it had the potential for a high giggle factor when they are involved in so many larger issues."[34]

Marsden recommended intercepting Comet Swift-Tuttle between the orbits of Saturn and Uranus in 2122[8]—too far from the Sun for Comet-chasers to be effective. But because of the comet's high orbital inclination (113°), he assumed rendezvous at the ascending node where the comet next crosses the Earth's orbital plane. Sending conventional spacecraft out of the Ecliptic requires heavy fuel expenditure or gravitational slingshot. Low-thrust, continuous propulsion systems don't have that limitation, so the Comet-chasers could catch threatening comets on return to the Sun. Asteroid orbits are less far-ranging, so they can close with them and divert them at leisure.

As John G. Cramer pointed out in *Analog*, how impact risks are assessed is a matter of definition. The chances of dying in an asteroid impact are slight, on a day to day basis, but so many deaths would result that the risk over 50 years is greater than from aeroplane accidents, tornadoes or electrocution[35]. But in a sense, statistical arguments are little use: there's one day on which it's actually going to happen and the number of days on which it doesn't happen is academic. For the few of us, still, who see things in that light, the lesson of the last ten years is that it won't be easy to arrange protection for the Earth without a quantifiable menace to give it the necessary urgency. All we can do is keep watching, in hopes to find something which is going to hit us, but not too soon to do anything about it. ■

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IN TIMES TO COME

November's cover story is Stephen Goldin's novelette, "The Height of Intrigue," which is itself a pretty intriguing compound of science fiction and mystery—two genres notoriously difficult to blend in smoothly. Goldin has done it with a situation deftly weaving murder, distinctly alien cultures and individuals, and a novel form of—transportation? Maybe that's not quite the right word, though *something* is being transported. For now, let's just say that Hertz and Avis, at least so far, aren't in direct competition with the rental agency that plays a key role in this story. If they ever are, they'll have to recognize that things that seem trivial to clients from one culture may have the most profound significance to those of another!

Steven L. Gillett, Ph.D., provides the fact article, on "The Environment, Technology Drivers, and Nanotechnology." Sometimes it's easy to get so caught up in the details of how a technology would work that you forget the key question of what would drive anyone to do the work of developing it. And the most likely answers may be quite different from what you'd first guess. . . .

We'll also have short stories by Hayford Peirce, Jayge Carr, and Mark Rich—and last but by no means least, the uplifting conclusion of Spider and Jeanne Robinson's *Starmind.*

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F. Alexander Brejcha

LOOKING THROUGH THE PERSONALS

Maybe there is *something to be said for Proper Introductions. . . .*

Lonely oxygen-breathing male seeks female companion.

Bi-sexual species professional seeks similar carbon-based female for friendship, possible relationship. Endoskeletal only, biped preferred. Must enjoy nature, intellectual discussions and harmonious music in 30 to 15,000 hertz range. Reply with DNA coding and hologram at InterStelNet address seeker02Bi@survey.com.

saBRRina@spo.com/060499;1123
Dear seeker02Bi:

Or should I call you seeker? :GRIN: What is your name anyway? And what on Earth is the InterStelNet? I know the Internet even reaches into orbit now, but did I miss a name change? I sent this as if you're on the Internet and I hope you get it.

I just had to respond to your ad. It's the first time I've gotten one in E-mail, and it's wild. "Bi-sexual species," "carbon-based" and "endoskeletal"? Usually I see things like non-smoking, non-drinking and HIV-free. Well, I can assure you I fit your criteria, even if my endoskeleton is probably a little more deeply buried than most guys are willing to put up with. Occupational hazards of being a desk-jockey at the bottom of the world. My name is Sabrina Wilcox (saBRRina—it's cold down here!), I'm forty

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years old and single, and if you are interested, I am a bipedal non-smoker, non-drinker, and HIV negative. Not much chance for infection when I work twelve-hour days buried in the middle of Antarctica, and the only men here are past their primes, married to their jobs or other scientists—and the only affairs they are interested in is the standard one with the Internet. :–(

Like I said. Occupational hazards. The guys are working on the radio telescope or on wildlife monitoring, and I'm monitoring subsurface ice flows around the whole region via robot probes and remote sensors.

What do you do? You said "professional," but you didn't explain what kind. Tell me a little about yourself? Even if I'm stuck down here for the moment, having an electronic pen pal with your imagination might be just the break I need. Besides, I'll be out of here in another three months, two weeks, five days and seven hours . . . can you tell I'm looking forward to it? ;–)

Oh, about the DNA coding and hologram: you're out of luck with both. I did attach a color graphics file with a photo of me, but that's all you're going to get. I don't exactly have my DNA profile lying around to send up online, so I can't help you there. But as for the interests you mentioned: we're in synch there—especially if you like classical music (but please: no opera). And add old movies to that list. I especially love the old black and white comedies from the thirties and forties. Frank Capra, George Cukor and those directors, with Cary Grant, Gary Cooper, Katherine Hepburn and Jean Arthur. It's hard to find them in original form since they've all been colorized and made three-dimensional—but I'm building a nice collection in my computer thanks to some online friends.

Well, take care, and hope to hear from you.
Sabrina :–)

seeker02Bi@survey.com/
060499;1746
Dear Sabrina :–)

If that is correct. Earlier in your note, you indicated Wilcox as your secondary name. Is :–) a middle name? If so, what are the :–(and ;–) you used?

Irrelevance.

I am concerned. I am replying in a text mode equivalent to your transmission, and please forgive if my language usage is awkward. That is because I do not interact with your people. I am not empowered to. I am an observer, but my servo-system is malfunctioning and interfaced with your electronic communications system and improperly posted several random-address companionship requests to demographically appropriate users. It is factual that I am lonely, and I have verbalized that feeling where my servo could hear it, but I am in this system on limited placement and will be relieved in due course. Further communications would be inadvisable due to policy constraints of my placement. . . .

But . . . a query:

In examining your attached graphics file I noticed a similarity between feature topography and your sym-

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bology. Further correlation with my existing morphological and cultural data-bases indicated that positive emotional states in humans result in an upturned mouth, equating with the stylized :–) symbol—if it is turned halfway around. Is this a correct deduction? It would also correlate with your use of :–(when discussing a less favorable situation.

If so, your communicating with me indicates a positive emotional reaction. But what is ;–)?

Awkward.

I too appreciate interaction. Due to additional equipment malfunctions, I am unable to communicate with my supervisors or home until my relief transport arrives in two of your years.

Perhaps some discreet communications would not be totally inappropriate, if kept confidential? Thank you.

Seeker :: =E)

saBRRina@spo.com/060599;0923

Why, Seeker, what big teeth you have.... Ever read Little Red Riding Hood?... Naah, probably not.

:: ? Plenty of "four-eyes" online—still, despite new surgical corrections—but usually that means glasses. Are you trying to tell me you actually have four eyes? You REALLY have to attach a picture with your next note. :–) I'm also curious, did you get any other responses to your ad, or am I the lucky solo sucker?

My query: Who's stranger: someone who posts an ad like yours, or someone who replies? :GRIN:

I'm trying to figure you out, and I've narrowed it down to two possibilities. Either you're some hardcore science fiction fan doing some net-surfing for fun, or you're actually an alien observer. You'll have to forgive me for leaning towards the former explanation, but I have to admit you piqued my curiosity since I am a bit of a science fiction fan myself.

But I'll warn you: my tastes run to older stuff. Too much fantasy these days. It may be totally ridiculous, but I love the old space operas of E.E. Doc Smith and John Campbell, where huge space ships and fantastic aliens keep upping the ante in their battles and explorations—even moving whole planets when necessary. Maybe that's another form of fantasy, but when reading it, I can pretend it's SCIENCE fiction. And I like a lot of the hard science fiction stories and novels that were out later, but I'm sick of dragons, shape-shifters, cyberpunk and alternate universes.

Oh, you're right about the symbols (as if you don't already know that :GRIN:) and ;–) is a wink, of course. And those three are only a few of the dozens of BIXies I see every day on my base Network. Others include :–D for a big smile, 8–) for smile with glasses, and....

Hmm... I'd better be careful or I'm going to start believing you!

Really, what is it that you do do? Oops... hopefully your work isn't... crap, that is. It can't be too bad if you don't have any communications with your supervisors. I'm really curious. I've been trying to figure out where on the Internet you're hooked in, and how you can send and receive messages with a non-standard E-mail

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address. I'd love to talk about that—much more than continuing to role-play "alien observer and human." I never could get into those games.

Well, if you want to get "real," I'd love to "talk" again. Take care.
Sabrina

seeker02Bi@survey.com/
060699;1311
Dear Sabrina:

Forgive my response delay, but I have been concerned about the wisdom of communicating with you. But I also had a personal concern.

Given the absence of the positive emotion symbol after your name, I am worried that I may have offended you. I had no such intent. Some of your colloquial expressions are beyond my servo-system's translation capabilities, but I wanted to respond to a few of your points, hoping to correct any misconceptions, even if this is not a wise thing to do.

And it is so lonely here!

First: Yes, I do have four eyes. The placement is not the same as the symbology would indicate, but they allow for greater acuity and frequency range. Obviously that means that I am indeed an alien. I am not allowed to leave my observation post for the four year duration of my sentence so you need not worry. As I stated before, I am only here as an observer.

As for your statements about planetary relocation, I will admit that such is impractical, and limited to smaller worlds without life-forms. But occasionally it has been useful if the body is rich in radioactive materials. Such, as you know, cannot be synthesized. The other fictional elements you refer to are also not unheard of. With the exception of cyberpunk. I have to admit I fail to fully understand the definition of the term I have found.

As for my actual occupation and purpose for being here, I prefer not to go into any details about this. I am already violating guidelines simply by revealing myself. Please understand that I merely wish to have someone to communicate with. Tell me about your work, and yourself. All my data on your species is based on what I have learned in school, and is incomplete and fragmentary. I would love to learn about you first-hand.
Seeker :: =E)

saBRRina@spo.com/060699;2312
Dear Seeker:

I almost didn't answer, but you really seem to want to talk. I'm just puzzled by your constant efforts to make me believe you're an alien. As "incomplete and fragmentary" as your knowledge of us supposedly is, you seem to be awfully good in English, so why not just fess up and tell me what kind of work you do. No more of this alien stuff, please.
Sabrina

seeker02Bi@survey.com/
060799;0825
Dear Sabrina:

I can understand that it is difficult for you to believe that I am actually an alien, and it would probably be better if I devised a story of a terrestrial occupation, but other than some

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general details, I do not have sufficient knowledge of such to continue a subterfuge of that sort. My ability to converse in your language is purely a function of my servo-system, and does not reflect my own expertise.

But, as you are obviously an intelligent individual who has compatible interests, I will try to explain what it is I do. This is a sensitive area, and the reason for the concern I mentioned earlier. However, as I have already violated my prime rule by responding to your note—I cannot be held responsible for the message that my servo-system dispatched—I may as well be honest and respond. But please, keep this matter fully confidential.

I have enclosed a full-figured graphics file in the same format as the one you sent to me so that you know what I look like. I am a member of one of the three space-faring species in this section of this Galaxy. We are looking forward to your species being a fourth, once you settle your internal conflicts and develop interstellar travel capability. I am here as part of a monitoring net to protect this system from outside influences so that you will develop on your own.

There is an electronic shield in place around your system that screens out any of our communications signals so that your SETI projects do not intercept them. It is not foolproof, but at least it scrambles our own signals so they are not readily detectable. Unfortunately, it has also caused a few minor errors to creep into some of your radio-astronomical observations, but the shield has been continuously improved to minimize such problems.

This shield is the first level of isolation. The second level is a ring of observer stations such as mine, in place to keep any overly curious tourists from visiting your world. There has also been a problem in the past of assorted students making illegal visits and contacts, leading to concern among certain segments of your society, and we are here to prevent this from happening again.

If you recall, I had mentioned serving a "sentence" here. What that means is that my duties here are my punishment for having been one of those students making illegal visits. Now I guard against others doing the same, and for every one I report, I receive a reduction in my sentence. Except I cannot report anyone due to hardware problems. I have to wait for my parole officer to contact me.

But this is a lonely posting! There have not been any violators for over a local year.

Please do not stop communicating with me. . . .
Seeker :: =E)

saBRRina@spo.com/060799;0909
Seeker:

Your sentence has been doubled.

There is a third level of protection in place, and periodically we test the first two levels for a potential for violations. There was no servo-system malfunction, merely a service check of your performance—and as you failed, my sentence has just been reduced by one year, local time. Thank you!! Sabrina :–D ■

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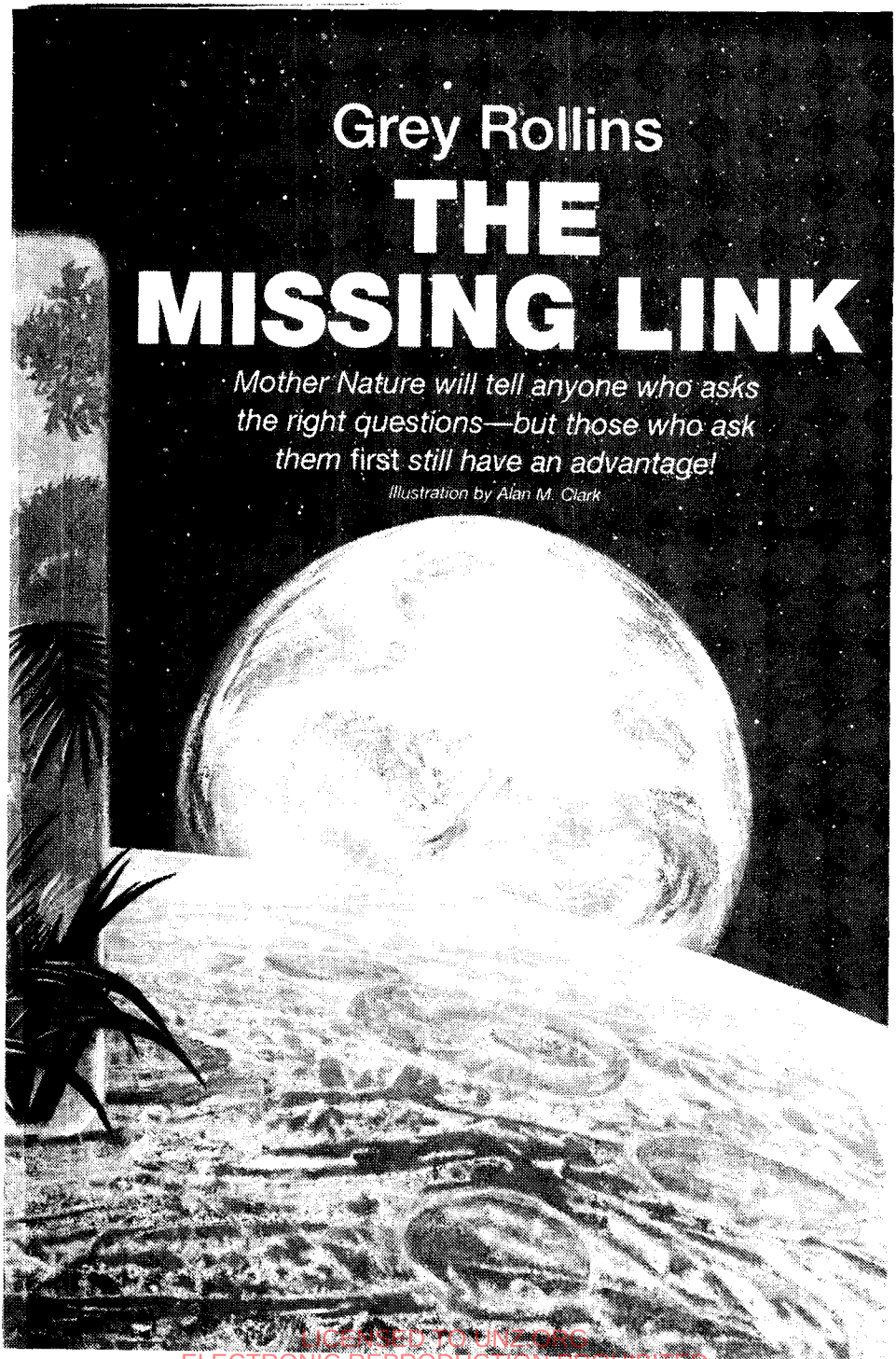
Grey Rollins

THE MISSING LINK

Mother Nature will tell anyone who asks the right questions—but those who ask them first still have an advantage!

Illustration by Alan M. Clark



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Throughout history, human societies have been restrained by the rate at which information could travel. The size of empires was determined by how fast news of a rebellion in the provinces could reach the capitol. Merchants receiving word of overseas markets via sailing ships could only guess at what happened in the interim.

Beginning with the discovery that intelligible signals could be sent by electromagnetic waves, global communications became effectively instantaneous. The information age had begun.

Whereas many situations require immediate response, the ability to receive news in time to react appropriately made a huge difference in how humans regarded their world. Events that had previously been over before the news reached interested parties could now be reported essentially in real time.

There were still, unfortunately, limitations on what could be accomplished. As long as all that was required was the exchange of information, response could be immediate and effective. But some things, such as a doctor responding to a medical emergency, require physical presence. Those who could not afford to have an agent on the spot to respond to their instructions were still essentially impotent. Power remained concentrated in the hands of those who could afford a representative.

The introduction of the Holmes Door changed that. The ability to walk through a Door and instantaneously be in another place ushered in an entirely new class of response. Although the apparatus was too bulky and expensive for individuals to own their own Doors, it was only a matter of time before larger, more institutional users began to show an interest. . . .

The night air was thick with humidity, almost velvety to the touch. A slow-moving line of thunderstorms had passed through late in the afternoon, but had not brought any relief from the oppressive heat.

Pat Connelly was late getting home. Insects flared briefly in her headlights before smashing against the windshield as she hissed down the road, trying to make up time.

Up ahead was an older model Ford, the pair of taillights that she had been following for the last twenty minutes. They had pulled onto I-26 just outside of Charleston, probably after taking a hit at a brightly lit fast-charge station at the top of the ramp. Fords were notorious for getting poor mileage as their batteries got older.

Of course, with the depression gathering momentum and a war on, it wasn't likely that the owner of the Ford could easily get new batteries. They would just have to make do with what they had for a while longer. Pat could afford to feel smug, she had bought a brand new Canberra just two days before the President had slapped an embargo on imported Australian goods. If its reputation was any indication, she could expect to get years of use out of the car before it required any maintenance.

Suddenly, the car ahead slewed vi-

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olently to the left. At first, Pat thought that they had swerved to avoid an animal in the road, but the car began to throw showers of sparks. Long strings of dancing orange pinpoints spiraled across the concrete. The car spun nose-for-tail, backing down the road. It began a slow arc, heading for the median.

Pat was already riding her brakes, frantically trying to keep from overrunning the Ford as it slowed. When it hit the rougher pavement at the edge of the road, it shuddered and turned more sharply. It literally plowed the grass in the median, leaving dark furrows where it had passed.

As it came to rest, Pat pulled in behind it, leaving her headlights on so she would be able to see. She started to get out, then froze in confusion. Something was wrong. She could see the interior of the car—all of it, not just a narrow band through the windshield. The front of the car was gone. So were the driver's legs. Bright arterial blood spurted from the stumps.

Panic hit, simultaneous with a wave of nausea. She wrenched open her door and leaned out, retching. Precious seconds passed before she could master her stomach.

Without looking back at the driver of the Ford, she began pawing for something, anything, that would serve as a tourniquet. A scarf . . . but she would need another, as both legs were missing. Frantically, she dug through her pocketbook, then realized that the pocketbook's strap was as good as anything else she might find. She dumped the contents on the seat, placed her foot against the pocketbook, and jerked the strap with her hands, ripping it loose.

It took all the courage she could muster to turn and face the Ford again. The driver, still strapped into the seat, was staring slack-jawed at his thighs. Swallowing hard in a burning throat, she slapped at the distress button on the dash with her palm, automatically broadcasting a radio signal requesting assistance.

Biting her lip, she then did the hardest thing she had ever done in her life.

As the crow flies, Sergeant Owen Rivers was not far away when the MID—Motorist in Distress—alarm on the dash of his highway patrol cruiser went off, but, as the old saw goes, you can't get there from here. He had to turn his car around, retrace the last twelve kilometers he had driven, travel two kilometers east to a junction with a secondary road that intersected with the Interstate, then speed westwards towards the spot marked on his heads-up display.

By the time he arrived at the wreck, nearly fifteen minutes had elapsed. Before getting out of the car, he sized up the condition of the Ford and its driver and radioed in for an ambulance.

Seconds later, he was feeling for a pulse in the driver of the Ford. If there was one, it was too faint for him to feel.

There had to be at least one other person—the driver of the Canberra. Presumably the one who had tied the makeshift tourniquets. He pulled his

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flashlight from his belt and looked into the interior of the Canberra. No one.

Frowning, he turned and fanned the grassy median with the beam. It did not take long. She was on her side, just a few meters from where he stood.

Rivers crouched by her side. "Ma'am?"

Blearily, she looked at him, trying to focus behind the beam, on his face. "I tried," she said, her voice trembling.

"I know ma'am. I understand. Are you hurt?"

This was not a trivial question. She was covered with blood, and, as yet, he did not know whether it had been a single or two car accident.

She shook her head. "Not me. Him," she said, pointing back to the Ford.

She could be in shock and not feel any pain. "Don't try to move, ma'am. There's an ambulance coming."

Her head shook slowly. "I'm all right. I just . . . I'm sorry, it was just too much for me . . . I threw up. I'm OK . . . promise."

"Are you absolutely certain?"

She nodded.

"Can you stand?"

"I . . . yes."

"Let's get you to my car, then."

Twenty minutes later, Rivers had a wrecker, an ambulance, another Highway Patrol cruiser, and Pat Connelly's version of what had happened. He also had his own observations and a few quick measurements of the scars left on the pavement by the Ford as it skidded to its final resting spot, although he was not certain what they would prove. They would not be easily compared to skid marks from rubber tires.

The Ford had experienced a major structural failure, resulting in the front detaching from the body of the car. Without the front tires and the steering mechanism, the driver had, understandably, lost control of the car. The leading edge, dragging on the road, had represented a braking force, and the car had spun around backwards. The driver, who had sustained grave injuries when the car separated, had died of blood loss in spite of first aid given by Pat Connelly. Everything fit together.

Almost . . . .

Neither he nor the other trooper could find the missing front end of the Ford.

Alan Lister, the commissioner of Crisium, the de facto capitol of Luna, sat in his home tunnel, watching the evening news beamed up from Earth. The tunnel's computer projected scenes of carnage into the air in front of him. The war on Earth continued. The United States, following numerous precedents, was involved in a bloody "act of support" for their Mexican neighbors . . . without the formality of declaring war. And, lacking a firm sense of direction, they were making a horrible mess of it.

Brazil, the aggressor, had chewed its way northwards out of South America. Facing drought, crop failures and famine, the Brazilians had begun a desperate war, decimating the poorly equipped and inexperi-

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enced armies of the other South American countries. Central America had come next. The Mexicans had given them their first serious resistance, but it had not been enough. The Yucatan peninsula had fallen and virtually everything south of Mexico City was in Brazilian hands. The battered and demoralized troops on the outskirts of the Mexican capitol were not expected to hold out for much longer. Stories told by refugees filtering north out of Puebla and Tlaxcala were enough to suggest that it was not too soon to start inquiries into war crimes.

Anne, Alan's wife, came up behind him and slid her hands down across his chest, encircling his neck. "There's nothing you can do, babe. Quit torturing yourself."

"We may have declared independence, but I can't forget that I was *born* an American. It hurts to see this happening."

"Then why watch?" she asked reasonably.

He shook his head. "I don't know. I . . . it just seems as though there ought to be something we could do to help."

"Alan, our entire population up here on Luna is less than that of one decent-sized city down on Earth. It's not as though we could send them enough troops to count for anything."

"I know, I know. Logically, I tell myself that we're safe up here, and that we have no obligation to do anything whatsoever about what's happening on Earth, but emotionally, I feel that I should be doing *something*."

"Does the ability to look down upon all the mere mortals of Earth make you a god?" she asked.

He gestured at the news projection. "I'm virtually omniscient, but not omnipotent. I'm a pretty poor excuse for a god."

"You're going to worry yourself sick over this."

He reached up and took her hands in his, then kissed the palm of each in turn. "Not with you to look after me."

She bit him gently on the ear. "Come with me. I've got an idea . . . something that will take your mind off the war for a while."

He rose and followed her towards their bedroom, but as he rounded the corner, he cast one last worried glance over his shoulder at the news.

Private Lawrence Enceas lay on his back in the dirt near the edge of a small clearing, wondering if he would live.

The Brazilians had some kind of variation on a Gatling gun that spewed flat, jagged pieces of metal. Kind of controlled shrapnel; something you could aim. Hell on infantry. Hell on Earth.

Enceas never wanted to hear a sound like that again. A ringing whine that set your teeth on edge. Undertones of metallic buzzing. They said that the magnetic field the thing threw off was powerful enough to stop your watch.

Well, his watch had stopped all right, but it wasn't the magnetic field that did it. His watch had been on his left arm—the one which was now

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shredded into something resembling hamburger. He'd also taken hits in his side. At that, he had come off better than Chuck Ripley. Ripley had been point.

The Brazilians had moved in more quickly than anyone had anticipated. With brutal efficiency, they had swept the area clear of all human habitation. Mexican, American, civilian, military . . . it didn't matter.

Enceas and his companions had made it easy for them. They had blundered into a Brazilian trap.

Four men had survived the ambush. Three of them were severely wounded. The survivors huddled at the edge of a small clearing and watched. Two hours had passed since they had called for evacuation. They had been told to look for the "Kicker," the KK-103, in twenty minutes. It had never arrived.

Brewster, who was unhurt, stood a one in a million chance of walking out. None of the three wounded would live long enough to see the next sunrise without medical intervention.

Except for the flies and the heat, Enceas was about as comfortable as he could hope to be. The batteries in the nerve blocks would outlast him, and the supercoagulants had all but stopped the blood loss. He had his gun by his right hand, but had doubts as to whether he would be able to fight effectively when the Brazilians finally got around to checking on their missing men.

That was the Brazilian way. Three man teams went out, armed to the teeth. If one didn't report back, the Brazilians sent a hundred after them. Overwhelming, crushing force was the response to every provocation, no matter how slight.

Far away to the north, he heard a faint buzzing sound. Muted by distance, it could have been the Brazilians. Then again, it could have been a fly, coming to join the cloud tormenting him.

As things stood, Enceas expected to die during the night. Intellectually, the thought displeased him, but the drugs had blunted his emotional reaction. He was alert, but once-removed. They had been lavish in using the contents of the medkit. Either they would get picked up in time . . . or they would not. In either case going sparingly on the drugs would count for nothing.

The unspoken plan was for Brewster to watch over them until they died, then head north, trying to find, and penetrate, the line from behind. Whether he would make it was anybody's guess. Enceas doubted that he would, but kept his opinions to himself.

With surprising speed, a sibilant whisper approached from the south. It flew slightly east of the clearing, then looped and came back, slowing as it approached. Warily, the nose of a Brazilian Jaguar poked over the edge of the trees surrounding the clearing as it hovered in VTOL mode.

In one smooth motion, Brewster swung his gun up, braced his shoulder against the bole of a tree, and sighted on the Jaguar. Three quick reports followed.

Muzzle flash provides an accurate

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assessment as to the position of the enemy. The automatic weaponry in the nose of the plane backtracked the flares and fired. Brewster tucked his arms in, his back pressed against the trunk. He grimaced as bark shredded from the far side of the tree. As the burst ended, he squeezed off two more shots.

This time, the Jaguar came over the edge of the trees. With sinister grace, it slowly lowered itself into the clearing. The nose remained oriented on Brewster's tree.

Brewster peered carefully around the trunk, but only far enough to see the very tip of the wing. When the Jaguar's wing was just three meters above the ground, Brewster calmly stepped from behind the tree, lined up his sights, and fired directly into the face of the pilot, who was staring down at him. The first two shots ricocheted from the clear canopy. The third starred the plastic. The fourth and fifth penetrated, even as the forward cannon let loose, spitting explosive shells into the forest above and behind him.

The Jaguar executed a flat spin, slewing into the trees only a few meters away from the Americans. The left wing buckled as it hit the trees, tilting the opposite side until it hit the ground and bent. The groaning of the metal was clearly audible above the sound of the engines. Then the fuselage simply sat down. The heat from the exhaust started fires in the tree debris and underbrush.

Brewster looked down at Enceas, "I think it's time to go."

Enceas looked at him as though he was crazy. "Why in hell did you go and shoot at it? Now they *know* we're here."

He shook his head. "They already knew. That's why he hovered up there," Brewster said, gesturing towards the tree tops. "Those things have a mass spectrometer in the nose. They know the signature of the powder in our shells. For all I know, they have the profile of the volatiles in the soles of our boots."

"Jesus," Enceas breathed.

"Taking him out will buy us time, but not much."

"You act like it was easy."

Brewster shrugged. "A design flaw in the Jaguar. The eight millimeter guns can depress, but the cannons can't. When he couldn't get me with the eights, he had to come down to our level to use the cannons, eyeball to eyeball. I knew I could crack the canopy if I could get in enough shots. It was a calculated risk."

"Your calculated risk wasn't good enough for Tommy," Harry Hughes said from behind them. "He caught one that missed the tree."

"And then there were three...." Enceas said quietly.

Daylight was no help.

The late afternoon Sun was blasting down on the concrete ribbon of I-26. The surface of the road shimmered in the heat. Sporadic traffic whistled by, almost close enough to touch.

The wind of each vehicle's passage blew Sergeant Owen Rivers's hair across his forehead. Absently, he reached up and raked his fingers through it to restore his part, only to

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have it blown again by the next truck. His attention was on the road surface, trying to read the story of what had happened the night before.

The highway patrol cruiser sat behind him on the outside shoulder of the road. He opened the door and reached inside, pulling out the electronic note pad on the front seat. He didn't really need it. He remembered the accident clearly. It was simply a focus for his attention.

Logic dictated that the missing part of the car should be nearby. After all, it wasn't as though it was going to drive off by itself, especially since the batteries were in the back half of the car. How far could it go without power?

Keeping his eyes on the scars in the concrete, Rivers walked their length. Nothing. Absolutely nothing that he hadn't seen the night before. He prided himself in being thorough, but for once he was wishing that he had left something undone. There had to be some clue here that would give him a better understanding of what had happened to the Ford.

Loose ends annoyed Rivers. It chipped away at his professional pride to leave questions unanswered. Many of the cases he was proudest of were ones where he had worried at some seemingly insignificant detail until it opened up entirely new avenues to investigate.

And over three hundred kilos of missing plastic and aluminum alloy was hardly something he could ignore. There was a rational explanation for what had happened. All he had to do was find it.

Cursing under his breath, he walked back to the beginning of the scar. The key was here, at this end, not at the end where the remnants of the Ford had finally left the pavement.

He mopped his brow with his shirt sleeve, staring at a fast food container, already yellowed by the Sun. Within another week it would be dust. Throwing litter out of cars was still illegal, but hardly the problem it had once been. Some idiot had thrown it out the window . . . .

His eyes narrowed and a slow smile crept across his face. What Monica called his "gotcha" look.

At one hundred kilometers per hour, nothing dropped straight to the ground. It fell in an arc. Carefully, he backtracked a short ways along the lane the Ford had been using. Right about . . . *here.*

Even on his hands and knees, he nearly missed it. There was a tiny groove, less than the thickness of his fingernail, that cut diagonally across the pavement. The sides were so smooth as to be almost polished. The impossibly sharp edges were already crumbling where tires had crossed. Another twenty-four hours and the cut would have been nearly invisible. He opened his knife and tried to slip the blade into the crack. The tip went in, but the blade was too thick to penetrate further.

He stood, staring at the hairline groove in the pavement. It was too smooth to have been there long. That left the question as to whether it was related to the previous night's wreck. Rivers didn't believe in coincidences, but he failed to see how he could

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relate the two.

Disappointed, he headed back to the cruiser. He had hoped to find something a little clearer than a slot in the pavement. Even if it was related to the accident, it still didn't give him a clue as to the whereabouts of the rest of the Ford.

Lawrence Enceas was deeply weary. He had lost too much blood; he was weak. Even Brewster, still unhurt, was tiring quickly. For every step Enceas and Hughes took, he took ten, circling them, doubling back to check for pursuit, scouting ahead. Harry Hughes, the only other surviving member of their team, was ashen faced, and for the past hour had spoken only when directly addressed.

Shortly after abandoning the clearing, they had seen a small Brazilian force working their way silently through the trees, but had managed to avoid being spotted. There was no question about it, they were being hunted.

Enceas and Hughes, leaning on each other for support, stumbled into the small depression where Brewster was waiting for them after checking the path ahead. They lay gasping for breath for a few moments before anyone spoke.

"Gentlemen," Brewster said. "I have good news and I have bad news."

"Go for it," Enceas panted.

"The good news is that there's another clearing ahead that would be perfect for a pickup."

"The bad news is that there's no pickup coming," Enceas finished for him.

"Well, actually, the bad news is that the clearing is recent. Possibly only a few hours old. It might be a trap."

"So you think the Brazilians cut a hole as a lure for us?" Enceas asked.

"Maybe, maybe not. I didn't see anyone, but that's no guarantee. Those assholes wrote the book on jungle tricks."

"Is it big enough for a Kicker to get in?"

"I think so."

They were silent for a few minutes. The only sounds were of labored breathing and the buzzing of flies. Enceas was startled to hear Hughes speak.

"What made the hole?"

Brewster's mouth tightened. "Looks like a fire fight. The trees are chewed all to hell. There are enough toothpicks in there to keep Godzilla happy for a thousand years."

Hughes tried to snort in derision, but began coughing raggedly. As soon as he could control his breathing, he said, "Hell, let's do it. Anything's better than sitting down and waiting to die."

Brewster looked at Enceas. "And you?"

"Let's call in from here. Assuming that we get through, they'll already be on the way by the time we get to the clearing."

They spent ten minutes trying to raise an answer on the radio, but without result.

"Let's get this over with," Enceas said. "If either of us," he gestured at Hughes, "pass out, you'll have a helluva time trying to move us. We

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might as well make the clearing while we can still move under our own power."

Slowly, fighting exhaustion, they moved ahead. Hughes tripped and fell, dislodging one of the electrodes from his pain blocker. By the time they got it taped back into place, his forehead was covered with a sheen of fresh sweat and his breath was coming in short gasps.

Supporting him with his good arm, Enceas took his left side, while Brewster took his right. Together, the three of them lurched forward.

True to Brewster's word, it looked as though a giant beaver with dull teeth had been chewing on the fallen tree trunks in the clearing. They collapsed against the trunk of a tree still standing at the edge of the clearing, sliding to the ground.

"Try to call again," Enceas said.

"Let me catch my breath," Brewster said. "I don't see how anyone survives in this heat."

"We won't, unless we get somebody to come after us."

Brewster pulled out the radio and switched it on. "Eagle Three to Mojo . . . Eagle Three to Mojo . . . ." After trying unsuccessfully for several minutes, he switched the internal recorder to endless repeat and propped the radio against a rock at his side. As an afterthought, he reached over and flipped the switch to increase the transmitting power. It would drain the batteries more quickly, but might punch through to someone who could come get them.

"You sure it's a good idea to leave it going like that?" Enceas asked. "The Brazilians will follow that signal in."

"You have a better idea?"

Enceas lowered his head. "No."

Brewster gave him a forced grin. "At least it will end the suspense."

Enceas closed his eyes and allowed his head to slip back against a fallen trunk. "Wake me up when it's time to die. I wouldn't want to miss the show."

Lisa Entwhistle was beginning to get concerned. The reservations at the restaurant were for seven and Dan's flight hadn't arrived yet. It would take nearly an hour to get back to the house in five o'clock traffic, at least thirty minutes for him to take a shower and change, and an additional twenty minutes to get to the restaurant. She checked her watch for the hundredth time. It was going to be close.

Originally, they had scheduled more than enough time. He had been due in over an hour ago, but there had been delays on the other end. Now Lisa was left wondering if she should call the restaurant and cancel the reservations.

The dinner was to be a special one. Dan was taking her and her parents out to eat, for the express purpose of asking their blessing for him and Lisa to be married. Officially, her parents had not been told, but unofficially she was certain that they knew. What other reason would he be taking them out to eat at such a fancy restaurant?

She glanced at the watch again, silently urging the plane to fly faster.

A man with graying hair walked up

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to the ticket counter and picked up the microphone. Without preamble, he said, "Would those of you who are waiting to meet passengers on North American Air, Flight 371, from Charlotte, please come with me?"

Lisa frowned. Clearly, this was going to be bad news. Hopefully, he would have some information as to when the plane could be expected to get in. It wasn't until he led them into a large conference room a short ways down the corridor that she realized that something far more serious was happening.

The twenty or so people who filled the room were strangely silent. They did not talk among themselves; there was no idle chatter.

The man stood ramrod straight at the front of the room. When everyone had found seats, he began, "My name is Edwin Marchand. I'm the executive director at this facility, and I'm afraid that I have some bad news for you." He paused before continuing. "As you know, Flight 371 took off from Charlotte later than planned—almost fifty minutes late. Everything seemed fine until about ten minutes ago. At that point, the plane disappeared from our radar. At the same time, we lost telemetry from the plane itself. Now, it is true that occasionally the onboard computer loses communication with the ground-based systems. Under normal circumstances, the piloting computer is sufficiently competent to bring the flight in without further communication from us. Unfortunately, the fact that we lost radar contact with the plane at the same time would seem to indicate that there may be a more serious problem. I would like to ask that all of you remain in this room until we have more information. Some of the airport staff will be here in just a few minutes. They will have drinks and food so that you will be comfortable while you wait. I will personally bring you up to date on what's going on as soon as I have any further information. Thank you." With that, he turned and walked out of the room.

Lisa was desperately trying to ignore the cold acid of fear in her stomach. She glanced at her watch again. Five-fifteen. No matter how things turned out, it was becoming clear that they would not make it to the restaurant on time. She could not make herself admit yet that Dan might not arrive at all.

She stood and walked rapidly to the door. A woman in a seat nearby said, "He told us to stay here."

"I'm just going to make a call, I'll be right back," Lisa assured her.

Fortunately, there was a bank of phones not far down the corridor. She dialed the restaurant and canceled the reservations. Then she dialed her parents. "Mom? Something's happened to Dan's plane. They haven't told us what yet, but from the way they're acting, it's serious and I'm beginning to get scared."

She talked for a few moments longer, promising to call as soon as she knew anything more, then hung up. As she turned to go back into the conference room, she saw two men in military uniform approach the door, taking up positions on either

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side.

The sight of their uniforms and the businesslike expressions on their faces chilled her more than anything the man from the airport had said. If they were guarding the door, then that implied that there was something to guard *against*.

She was nearly to the door when a second, more ominous, possibility occurred to her. What if the men were being stationed there to prevent the people inside from leaving?

Lisa shrugged off the thought quickly, reasoning that they were there to keep the inevitable reporters from asking insensitive questions. But that thought led to the inevitable corollary—that the plane had crashed and that there might be fatalities. She didn't want to face that possibility.

Momentary panic flared as she struggled to suppress the thought, only to be overwhelmed by another realization.

Why were the two men dressed in *military* uniforms? Mr. Marchand had said that *airport* staff would be with them shortly. Surely the police or airport security would be sufficient to keep reporters at bay. Something was amiss.

Acting on impulse, she walked past the conference room door without slowing. Down the concourse a bit was a dining area. Clearly, she needed to get her thoughts in order before she faced anyone. Either she was being unreasonably paranoid, or there was a strong chance that whatever had happened was going to be covered up.

On reaching the diner, she slid into the nearest booth, only to sit staring at the menu without really seeing it. If the military was involved then that implied . . . what? That Dan's flight had been shot down? Don't be silly. They were nowhere near the battles raging down in Mexico. What if it was a terrorist act? Could someone have smuggled a bomb on board the plane? But wouldn't that fall under the province of the FBI? Surely not the military.

In her mind's eye, she reviewed the uniforms. Not combat fatigues, like in the news. These were white. They looked like the uniforms she'd seen worn around the Naval base. *Navy?* That raised more questions than it answered. But if . . . .

Just as she was beginning to consider this, Edwin Marchand and another man in a Naval uniform walked rapidly past.

The man in uniform was talking. ". . . And have someone check the gate to see if anyone arrived late to meet that plane. If so, take them to the conference room. Under no circumstances are any of those people to leave that room. Have . . . ." The two of them passed out of her hearing.

She bit her lip, counted to ten to let them get farther down the corridor, then walked as fast as she dared in the opposite direction.

Something, somewhere, wasn't right.

If Eric Gantt had gone straight home from his job at the quarry, he would have missed seeing it. But, as it happened, his friend Chuck Walters

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was staring under the hood of his car, and Gantt stopped to see if he could lend a hand.

"The damned car is pulling to the left—hard," Walters groused. "Either the wheel bearings have seized, or the left drive motor is getting weak."

"Won't drive a straight line, huh?"

"Not unless I fight it. Makes me wish I'd gotten a single motor drive, instead of one with a motor at each wheel."

"Yeah, but then you've got the losses in the drive train." Gantt leaned under the open hood and fingered the cables leading to the electric drive motor. "You're sure you don't have a high resistance connection somewhere in this line? Corrosion would cut the current coming through, and the motor'd seem weak."

Walters scowled at him, then at the car. "Hadn't thought of that. Got a minute?"

Gantt glanced at his watch. "Sure, plenty of time." He ran his fingers back up the wiring harness. "Oh, yeah. Something else. We ought to check the voltage regulator for this side. I think Chrysler uses two smaller ones instead of one big one. If that's OK, then we—"

His voice was blotted out by the wailing of the klaxon warning all personnel to stand clear.

Walters flinched. "Jesus! I don't know why they bother with that thing. By the time they drop the rock, everybody's on their way home. It's not like anybody's stupid enough to stay in the hole when it's time to shoot."

Gantt turned back to the car. "It's the law, Chuck. If MSHA catches them not sounding—"

There was a massive, earth-rending *burrrump* as the charges blew in the quarry behind them. Even before the rough-edged thunder of falling boulders ceased, Gantt knew something was wrong. There were undertones of rending metal beneath the sound of the rock. He turned and ran across the grassy strip along the edge of the parking lot towards the chain link fence surrounding the pit.

Walters rushed up behind him. "What was it? Did some moron leave a . . . truck . . . ." his voice trailed off into stunned silence.

"What the hell?" Gantt muttered.

Protruding at an angle from the solid rock wall of the quarry was the nose of a commercial airliner, battered, but still recognizable.

Lisa Entwhistle was torn. On one hand, she was frantic to find out what had happened to Dan's flight—and whether he was all right. On the other, she had to acknowledge that if she was confined to a room in the airport, control would pass from her hands into those of the executive director and the men in Naval uniforms. They might, or might not, choose to tell her anything.

Then again, if her suspicions were correct, there was the possibility that anything they told her could very well be a tissue of lies.

She drove erratically, sparing only a bare minimum of her attention for the road. Finally, after half an hour of agonizing indecision, she pulled her

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car up next to a tele booth in the parking lot of a pet shop that had been closed for two years.

The low-powered link in her car's dash sought the dial tone from the booth without her having to get out of the car. When connection had been established, she dialed the airport.

A face appeared over her dash, seemingly in the windshield. "Good afternoon. My name is Susan, how may I help you?"

Lisa began haltingly. "My, uh, husband was due in this afternoon, and he's not home yet. I was just wondering if you have any flights which are late."

"Do you know your husband's flight?"

She took a deep breath before answering. "North American Airlines, Flight 371."

Lisa watched as the woman's smile turned carefully bland. "Ma'am, I'm afraid that I'm going to have to transfer you to the executive director's office. I'm sure that they'll be able to help you."

The image over Lisa's dash went to a neutral blue as soft music played under a voice extolling the virtues of the airport's restaurants. It took ten seconds for the implications of what the woman had said to sink in.

Without even bothering to disconnect, Lisa floored the accelerator, quickly putting her car out of range of the booth.

She began to shake. Clearly, something was wrong if they were forwarding inquiries to the executive director's office. Judging from what she had seen and heard so far that afternoon, that was only likely to result in more indirection.

A small voice deep inside of her began to scream in agony. It was becoming increasingly difficult to maintain the fiction that Dan was alive.

A charge station further down the road had another tele booth. She pulled in.

A polite, recorded voice came up when her car established contact with the booth. "You have a call still in progress on another line. Do you wish to resume that call?"

"No!" Lisa screamed. "Hang up!"

"That call has been terminated," the voice said calmly. "Would you like to place another call?"

Gripping the steering wheel tightly, fighting tears, Lisa said, "Yes. Place a call to the nearest NewsNet office."

If she couldn't get to the bottom of this, perhaps someone who knew how to get around news blackouts could. Maybe they could get straight answers about what had happened to Dan.

Sergeant Owen Rivers of the South Carolina Highway Patrol sat on the hood of his car, watching figures swarm along the edge of the man-made cliff in the rock quarry. Although he was off duty, the dispatcher had called to let him know that something distinctly odd had happened. She thought that he might be interested, especially after the incident with the Ford.

She had been right.

Six high intensity flood lamps were

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spaced in an arc across the floor of the rock quarry. They were all focussed upwards on the silvery aluminum nose of what had once been a jet. Two more were angled down from the top of the wall of rock.

The central problem, of course, was that the jet had no business being where it was—seven meters below the surface of the ground. Ignoring the blatant impossibility of it all, he had called the airport to see if any airplanes were missing. None were. He had that straight from the executive director himself.

Rivers hadn't decided yet whether that made matters worse or better.

He had gathered a few basic facts after arriving three hours earlier. The workers had spent the afternoon filling holes drilled in the upper surface of the exposed rock face with explosives. The blast had gone off on schedule, a little after five o'clock. Dropping the wall of rock late in the day gave any unstable boulders time to fall before the workers returned in the morning.

When the rock fell, it had revealed the nose of the jet. The exposed portion had been crushed and twisted by the force of the explosion, and by the rock falling over it. Indeed, the drill had narrowly missed the plane on one side; the smooth, semicircular scar of the bore hole was easily seen.

Access to the interior of the plane had been gained by cutting open the sheet metal on top of the fuselage. Those who had been inside told of carnage beyond their worst nightmares. There had been people aboard. None had survived. Like a car wreck, the plane had stopped abruptly, but the passengers had kept going; most had not been belted in.

Rivers felt no need to see the inside for himself. He was content to sit on the hood of his car, slap mosquitoes, and contemplate the impossible.

Owen and Monica Rivers lived at the end of a court. The house was smallish, but adequate for their needs. They had no children and few friends.

Owen carried his first cup of coffee to the table, sat, and called out, "Computer, bring up the news, please."

The computer was quite capable of reading the news items aloud, but he preferred silence in the morning, so it projected the articles in print over the table for him to read. The lead story, as usual, was the war. Casualties were detailed. Brief clips of soldiers running past the mangled metal of a crashed and burning plane. The Mexicans, aided by the Americans, had managed to take back a small amount of territory west of Mexico City. Reading between the lines gave a different story, however.

Monica sat next to him, blowing the steam away from her mug. "Bad?" she asked.

Owen grimaced. "I'm afraid so. They're doing their best to make it sound like we're making progress, but the plain fact of the matter is that the Brazilians are going to take Mexico City within the week."

She shook her head. "How long do you think it will be before the President makes up her mind to do some-

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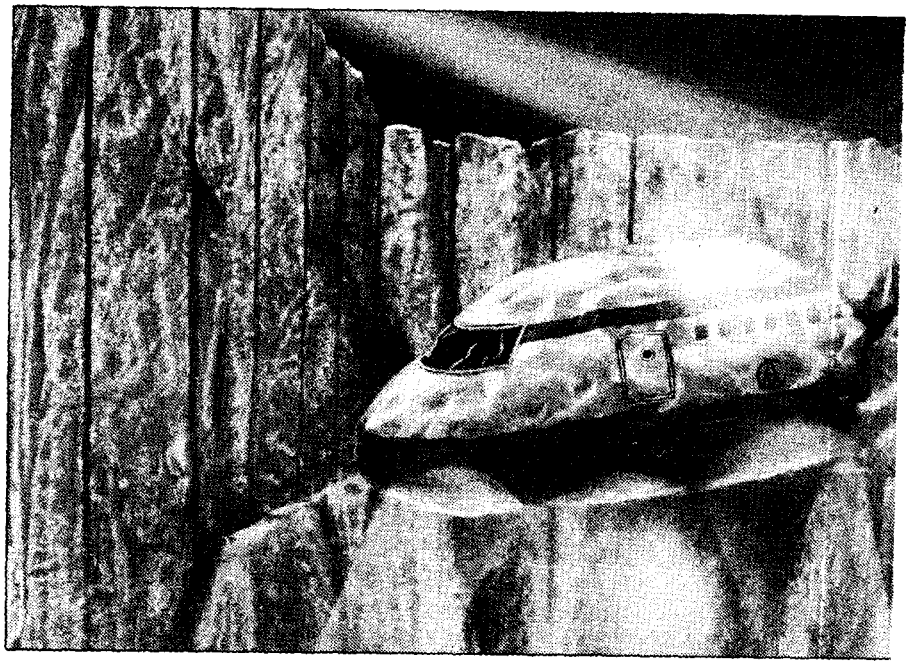

thing?"

Owen smiled bleakly. "She's already taken too long. Did you see the political cartoon yesterday of her fiddling while Rome burned?"

"Yes, but I didn't think it was *funny*."

"It wasn't meant to be. That idiot woman just can't seem to get it through her thick skull that pacifism only works if everyone else is also a pacifist. All it takes is one bully to spoil the party." He grunted. "If she doesn't declare war pretty soon, the Texans are liable to do it for her. They're getting just a bit worried over there."

"Can you blame them?"

He shook his head. "Nope." He gestured for the computer to flip to the next item. After reading for a few seconds, he began to mutter angrily under his breath.

Monica glanced his way, but knew better than to interrupt when he had that intent look on his face.

When he finished the article, he sat back slowly in his chair, eyes staring into the distance. "Well, well, well . . . now that *is* interesting!"

"What happened?"

"I went back out last night, right?"

Monica nodded. "You were awful quiet when you came in so I didn't ask what it was about."

"I know this sounds crazy, but they did a routine blast at a quarry and, lo and behold, there was a plane in the rock."

"*In* the rock?" his wife asked, frowning in disbelief.

"I saw this with my own eyes."

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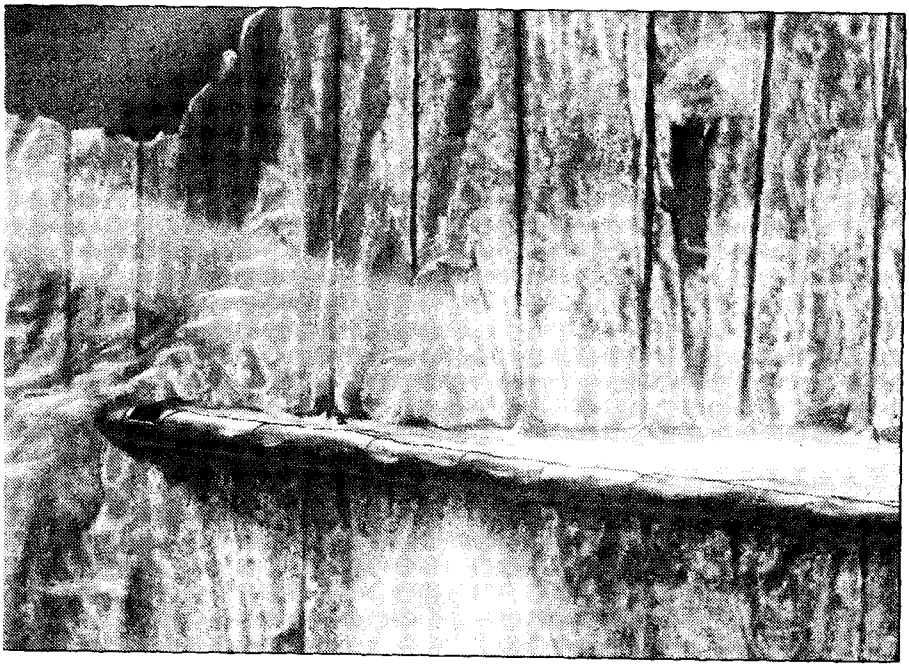

"Owen, the last I heard, two objects couldn't occupy the same space at the same time. What happened to the rock?"

He shrugged. "Beats me. I'm just telling you what I saw. Not only was it a plane, but it was a big plane. A commercial jet."

Monica looked as though she was beginning to fear for her husband's sanity, but held her silence.

"Now, setting aside questions of how the plane actually came to be there, complete with passengers—"

"What did the passengers have to say?"

"Um . . . nothing. They were all dead. I didn't go inside, but they told me that it looked like the aftermath of a bad crash. Messy."

She shuddered. "Excuse me for asking. I think I'll just keep a respectful silence from here on out."

"As if that wasn't bad enough, I, personally, was assured by the executive director of the airport that no planes were missing. Now I see here," he gestured at the news projected before him, "that somebody named Lisa Entwhistle has come forward, saying that a plane was due in late yesterday afternoon, but never arrived."

"But—"

"The article quotes her as saying that the executive director and the Navy, the *Navy* mind you, were trying to hold people incommunicado at the airport. She slipped out before they got organized."

"Owen, are you sure that you know what you're saying?"

He snorted. "Hell, woman, I'll per-

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sonally guarantee you that I *don't* know what I'm saying. None of this makes a damn bit of sense."

"But . . . the *Navy?* If a plane is missing, wouldn't it make more sense if the Air Force were involved?" She sipped at her coffee and sighed in resignation. "All right. What does the Navy have to say? Surely someone has gotten around to asking them."

"Yesterday the Navy was denying that anything had happened. Today the Navy is mum. Totally. They won't even say 'no comment.' "

Monica threw up her hands in exasperation. "Finally! Something that makes sense. Something, somewhere went wrong and they've started a cover-up. *That much I can understand.*"

Jennifer Holmes lived alone in a small tunnel deep in Crisium. The woman who had invented the Holmes Door was more comfortable with a life of solitude than with the celebrity to which she was entitled.

While actually very attractive, she was self-conscious about her right hand, which had no fingers, the result of a cogenital deformity. The rounded palm was both the source of her greatest strength and her greatest weakness.

Her early interest in mathematics had been inspired by the very fact that she could not count to ten on her fingers as other children could. Her ability to convert mentally from base seven, five fingers and two palms, to base ten, had led to other challenges. Numbers were pure and clean—and they did not tease her about her deformity.

Her insecurity about her appearance had caused her no end of difficulty in maintaining personal relationships with men. All of her liaisons had been with other mathematicians, men with no more personality than the pencils they used to solve equations. She didn't dislike men, she simply didn't understand them.

Since she had virtually no social life, Jenny spent most of her spare time reading. Books provided her, at least in her imagination, with the social contacts she lacked in real life. She had two large bookshelves filled with old-fashioned paper books. Anything else she wanted could be read off the terminal set into the wall.

She made at least a cursory attempt to keep up with the news, even though she regarded it more as an intrusion than as something actually worthwhile. The local Lunar news was mildly interesting. Anything beamed up from Earth she usually ignored, as it seemed less and less relevant as time went by. It had been years since she had lived on Earth and she had no intention of going back.

The news was muttering in the background as she prodded the contents of her refrigerator, trying to decide what to fix for dinner. She held up a plate of leftovers from the weekend and examined it. It needed to be eaten soon or it would go bad.

The voice behind her said something about a plane missing in South Carolina. Mentally, she shrugged. It was a sad thing when planes went down. So many lives lost at once . . . .

Still holding the leftovers, she eyed

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a small plastic basket of strawberries. Dessert?

"... Less than an hour later, a jet was discovered encased in the rock of a rock quarry not far away from the point where the plane left the radar screens...."

Jenny frowned. Encased in rock? That didn't make sense. She glanced back over her shoulder at the pictures being projected over her table. Aluminum skin protruding from a rough rock wall. Well, it looked like a jet. People were lifting what appeared to be... *were* body bags on ropes out of a hole cut in the top of the fuselage.

Without conscious volition, Jenny slowly turned to face the image.

"So far, over seventy positive identifications have been made in what must count as the most inexplicable air disaster in history. This is Donald Sayers for NewsNet...."

Jenny placed the plate of leftovers on the counter next to the refrigerator without looking, then said, "Computer?"

"Yes, Jenny?"

"Run a search back on that last thing. The one about the plane."

A barely perceptible pause ensued. "I've found four items related to that story."

Jenny slid into the one seat at the table. "Give them to me in chronological order."

Ten minutes later she sat back. What was bizarre and mysterious to those on Earth was horribly clear to her.

"Computer?"

"Yes, Jenny?"

"Call Alan Lister."

"At home?"

"Yes. If he isn't there, find him. I don't care if he's put a block on traces. Find him. This is important."

Alan Lister was already eating when the computer announced the incoming call. Inwardly he cursed, but it came with the territory. Being commissioner of Crisium meant that he was the one that people came to when things went wrong.

"Answer the call."

Jenny's face appeared, seemingly across the table from him. "Alan, somebody on Earth is building a Door," she said without preamble.

He blinked. "A Holmes Door? How do you know?"

"That jet that ended up in the rock quarry."

"I saw something about that. I assumed that it was silly season stuff."

"Anything that kills a couple of hundred people isn't a joke, Alan."

"Point taken."

"They don't know what they're doing. Obviously, they've managed to create a singularity, but they can't control it."

Belatedly, he was beginning to see where she was going. "And that's dangerous."

"You might say that," she said dryly. "If the next jet ends up here in Crisium, I imagine it might cause us a few problems."

Alan put down his fork. "What are the odds of that happening?"

"Virtually zero," she admitted. "The Door being what it is, theoretically they can place a mass anywhere

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in a sphere surrounding the Door apparatus. The radius of that sphere will depend on how much power they're using. Frankly, I doubt that they're using enough to put something up here, but in the meantime they could kill a lot of innocent people if they keep going the way they're going."

He chewed his lip for a moment. "So what do you want to do about it?"

"Honestly, I don't know. I haven't gotten that far. I saw something on the news twenty minutes ago, checked into it, then called you. I thought it was something you ought to be aware of."

"What do they want with a Door? Surely they aren't going to try to open a Door up here."

She shook her head. "I don't think that's what they're up to, Alan. I think they want one for the war. Even though I don't know much about military strategy, I can see how the ability to put troops down behind enemy lines would come in handy. No transit time. Just step out, do your job, then go home. You could sleep in your own bed that night."

Nodding slowly, he said, "Can't be shot down or blown up like a ship or a plane. The element of surprise alone would be worth it. Be anywhere, anytime." He took a deep breath. "OK, so the military wants a Door for the war."

"The Navy," Jenny put in. "When the jet disappeared, it was the Navy who showed up, issuing denials right and left."

Anne, seated next to Alan, spoke for the first time, "The Navy?"

Alan shrugged. "I guess that makes sense. Put a Door on a troop ship and have instantaneous amphibious landings. Storm the beaches and that sort of thing."

"Alan, there's no need for that," Jenny reminded him gently. "Just put the Door on a base back safely within the States. Ships, planes, and tanks just became obsolete. All you have to do is open a Door a thousand meters above a target, roll a bomb over the threshold, then close the Door, wash your hands and send out for pizza."

"Right," he said sheepishly. "I guess I'll need more time to get used to the idea."

Anne said, "What about the Brazilians? Surely, they've had the same idea. What if they develop a Door first?"

Alan flinched. "Jenny, how about it? Do the Brazilians have anybody good enough to do the math?"

"Well," she said slowly, "there's Barros . . . and Vargas might be able to do it."

Something feral came into his eyes. "Then we'll just have to move first."

Jenny's eyes widened. "I think I just opted out. Every time you want me in on the Door, people get killed."

Alan's mouth tightened. "That's what war's all about, Jenny."

Supercoagulants had been around for about twenty years. Applied topically, they acted quickly to reduce blood loss. The technique was nothing more than an extension of the body's own ability to scab over a wound. They were not, however, at their best with shredded tissue.

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There was simply too much surface area involved.

Lawrence Enceas was weak from loss of blood. In an earlier war he would already have been dead, or risking gangrene from the overlong application of a tourniquet. As it was, the supercoagulants had done their best, reducing his blood loss to a slow seepage.

Under ideal conditions, he would have been removed to a hospital for surgery to debride and reconstruct his mangled arm. Transfusions of blood and antibiotics, and plenty of bed rest would have stabilized his condition; his prognosis would have been good. However, he had had no choice but to remain active. The Brazilian patrols would find them sooner or later, but there was nothing to be gained from making it easier for them—the Brazilians did not take prisoners.

Eyes closed and breathing slowly, Enceas listened to the buzzing of the flies. He no longer had the energy to brush away the ones that landed on his face. He knew where the rest were, but tried not to think about it. The bandages would have to keep them from landing directly on his arm. Of course, under the circumstances, it didn't matter. He would be dead long before infection could become a serious problem.

Brewster shifted position only to wipe the sweat from his eyes. It was late in the afternoon and the temperature was beginning to drop, but the heat and humidity were still oppressive.

Harry Hughes roused himself on one elbow. "How long do you think it'll take them?"

"Take who?" Brewster asked.

"The Brazilians. That radio's been broadcasting our position for over an hour now. They know damn well where we are. One Jaguar would be enough to do us in."

Brewster chuckled softly. "They don't know that period. The last one they sent didn't come back. They don't know that there are only three of us, and they don't know how well we're armed. When they come after us, it'll be with a regiment."

"If we're broadcasting for pickup, they know we're hurting. Elseways, we'd be walking out."

Brewster seesawed a hand. "Judgment call. Could be that we're setting a trap for them."

"That's a joke," Enceas put in bitterly. "We were worried that this clearing might be a trap that they had set for us. This whole thing's nothing but a battle of nerves."

Brewster nodded philosophically. "Always is. Whoever blinks first, loses."

Enceas narrowed his eyes. "Is there anything we could do to make them think that there are more of us? It might buy us more time."

"Not that I can think of."

A single flat crack came from off to his left. The bark next to Brewster's ear scarred. He smiled sardonically. "Gentlemen, I believe we have company. Shall we show them how Americans fight?"

"Do we have a choice?" Enceas asked as he painfully rolled into position to face the incoming fire. With

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his good arm, he dragged his gun up his side and into position, careful to keep low so as not to give the Brazilians a good target. To his left Hughes was doing the same. Brewster slid into position beside him.

Nothing happened. No shots followed the first.

Hughes frowned. "Something's wrong. Nobody is going to fire one shot and quit." He craned his neck to look back over his shoulder across the clearing. "I'll bet they're—"

The nerve-wracking whine of the Brazilian Gatling gun was simultaneous with the sound of metal fragments sleeting horizontally through the underbrush. Hughes's head dissolved. Enceas and Brewster reacted simultaneously, flattening themselves against the ground.

Enceas gritted his teeth. "And then there were two."

Brewster was shaking his head. "Jesus! I should have seen that coming."

Conventional weapons fire was coming in now, along with the razor-edged metal from the Gatling gun. Shredded leaves and bark drifted down from the trees and brush above them.

Enceas glanced at him. "It isn't as though we didn't know that our ticket home had expired."

Brewster scowled, raised one eye over the fallen tree trunk he was hiding behind, and fired off a quick burst before replying. "Hope springs eternal, and all that. I keep hoping that I'll see a Kicker floating into the clearing."

"Don't bet the farm," Enceas told him. Without bothering to look, he awkwardly raised his good arm and fired over the trunk in the general direction of the shots. "Don't forget . . . we may still have a guy behind us up in a tree, ready to take pot-shots."

A deep, resounding *whump*, almost below the limit of hearing, came across clearly over the sound of the guns.

"What the hell was *that?*" Brewster demanded.

"Sounded like artillery, but neither side is going to drop shells in here with us this close together. They'd hit their own men."

"One way to find out," Brewster said, cautiously looking over the tree.

When he was silent for nearly twenty seconds, Enceas could stand it no longer. "What is it?"

Brewster shook his head slightly. "I dunno. Looks like—"

The Brazilian bullet took him neatly in the eye.

Enceas screwed his eyes shut. "And then there was one."

Something big opened up. A repeated *crump, crump, crump.*

Enceas frowned. It sounded like a—

"Any Americans left around here?" boomed a voice. Electronically amplified, it was loud enough to wake the dead.

Crump, crump. A sound he had not heard since training. A short range, rapid-fire mortar. Not a Brazilian weapon, nor Mexican . . . American.

The whine of the Gatling gun ceased abruptly, as though shut off by a switch. There was none of the usual winding down.

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Crump, crump, crump . . . .

"Come on, boys! We don't have all day, you know! We've got other pick-ups to make," came the amplified voice.

A trick?

Crump, crump!

Kickers were quiet, but not *that* quiet. He'd have heard it coming in.

Judging by the sound, the Brazilian fire had been cut in half. Was it safe to look?

Crump.

"Come *on,* gentlemen! My supper's getting cold!"

Enceas couldn't stand it. He carefully inched his head up, ready to duck back instantly. What he saw made him forget fear. Wonder washed through him.

Stretched diagonally across the clearing was a dimly lit hangar-like room. The walls were stone. Soldiers . . . soldiers in American fatigues were spread prone across the lip of the hangar behind sandbags, directing a steady stream of fire into the trees on the other side of the clearing.

Crump, crump!

The muzzle flash from the mortar lit the Mexican dirt a meter below the floor of the chamber. Below, above, and to the sides of the bizarre apparition, Enceas could still see forest. He had a perfectly clear view into a stone room floating in midair.

"Any Americans left?" bellowed the voice.

Enceas saw the loudspeaker now. The voice was coming from behind the soldiers. He decided to chance it.

"Over here," he called.

His voice was too weak to carry over the guns. He dropped his gun and seized a bush with his right hand and began shaking it with as much strength as he could muster. It wasn't much, but it was enough.

"We see you. Sit tight."

What followed made Enceas giddy. The improbable vision of a room hovering in the sky changed perspective, slewing rapidly towards him, pivoting as it came. The edge stopped just short of the trees.

"That's as close as we can get. Can you make it on your own, or will you need help?"

"Damn well going to try!" Enceas called in reply. Summoning every last bit of energy in his body, he lurched to his feet, stumbling towards the edge of the room.

The bullet caught him in the thigh, taking his leg out from under him, pitching him face forward into the dirt.

Boots slammed into the ground only a hand's breadth from his face. "Take his arm—Jesus, no, not *that* one, can't you see he's hurt? Got him?"

Strong hands lifted him and he felt himself swung sideways. As his body passed over the threshold, he felt an amazing transformation. When he hit the floor, he weighed only a fraction what he normally weighed. It almost seemed that he was floating. Perhaps blood loss was affecting his perceptions.

A face hovered only inches from his. "Are there any more?"

Confused and entering shock, he whispered, "Any more what?"

"Men. Americans."

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He shook his head slightly. "Only me left. All the rest are dead."

"Are you sure?" The man demanded.

"Yes."

The man bellowed, "Cut the Door! Let's get out of here!"

Instantly, the Mexican rain forest vanished, to be replaced by a solid rock wall.

Comprehension was slow in dawning. "A Holmes Door . . . neat."

The man who had been questioning him was already on his feet. He looked down. "What?"

Enceas shook his head slightly. "Nothing."

A man and a woman swam into his field of view. He felt distant tugging motions as they cut away the leg of his fatigues to begin work. Snatches of conversation floated into his consciousness. "Missed the femur . . . artery . . . we're losing blood pressure, somebody . . . ."

A hand slipped into his and squeezed. "Fight it. Stay here with me." A woman's voice.

Summoning the last of his strength, he fought to open his eyes. It was worth it. "You're beautiful," he whispered. "Who are you?"

"I'm Jenny." She blushed as she said it.

"Am I dead?"

"No, and you won't be if I have anything to do with it. I'm tired of killing people with this Door. Live, damn you . . . *live!*" Tears were streaming down her cheeks.

"I'm . . . trying . . . ." he sighed as his hand relaxed, slipping from hers.

* * *

"Jenny?" Alan Lister called softly.

"Whatever you want, the answer is no. Not just no, but *hell* no! Go away. I hate you and I never want to see you again."

Jennifer Holmes was slumped in the operator's seat for the Holmes Door. The Plexiglas booth had been hastily armored with steel plates. A small slot had been left open for Jenny to visually observe the Door. She stared out this slot blindly.

Alan closed the door to the control booth behind him. "I wanted to thank you for trying."

"Every time you ask me to come near this Door, people die, Alan. How do you think that makes me feel?"

"You didn't kill him. You tried to save him."

"I didn't even know his name."

"His name was Lawrence Enceas."

She clenched her fists and held them to her ears as though to block out the sound of his voice. "*Damn* you!" she shrieked. "How *dare* you come in here and tell me his name?"

"I thought you might like to know."

Her eyes squeezed shut and a tear slid down her cheek.

"Would you rather have left him to die alone in the jungle?"

A great, shuddering gasp shook her.

"At least here, he was able to see a friendly face before he went."

Slowly, unwillingly, her hands came down. She rose from the seat and stumbled towards him. He reached out to catch her.

She beat at him feebly with her left fist. "Damn you, damn you, damn you." She cursed with metronomic regularity as she pounded his chest.

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"Why do you do this to me?"

He wrapped his arms around her and held her. "I'm sorry, Jenny."

"He said I was beautiful," she said softly.

"Jenny, if—"

"Alan, I didn't want him to die. I moved as fast as I could. It's just that the signal from their radio was so tiny, so weak that it was hard to get a lock on it from up here."

"You did a wonderful job, Jenny. No one else could have done it."

"To think that I was so naive as to think that my Door would be used for good." She shook her head, sobbing. "It's been one long descent ever since the Door first opened—commerce, tourism, thrill seeking, riots, and now, warfare. I wanted us to go outwards, into space, not into the deepest, darkest parts of the human soul."

"Jenny, your Door didn't cause the Brazilians to start a war. With a little luck, it may even help to end the war."

"That's what they said about the atom bomb a hundred years ago, you idiot! It took fifty years of living in daily fear of nuclear holocaust before tensions calmed down enough for governments to put away their missiles. And they *still* worry about terrorists. How long will it take before people learn to live with my Door? What have I done? How many people will die because of me?"

"How many people will *live* because of you, Jenny? There's a war on down there. People need you." He lifted her chin with his fingertips. "If we move fast enough, we might even save a few next time."

* * *

Alan Lister was haggard. It was two in the morning and there were dark circles under his eyes. His jumpsuit was stained with blood and mud. They had just made the sixth drop in two hours, placing small commando units at carefully selected pressure points. Between drops, they had evacuated the tattered remnants of American and Mexican forces from what had been Mexico City.

The capitol had fallen at dusk. The Brazilians had wasted no time bringing in heavy artillery. Clearly, they were expecting to have to fight to hold their prize. It was up to those running the Door to accomplish by stealth what could not be accomplished openly, with brute force.

The commando teams were setting up to attack critical supply routes. Brazil, lacking a Door, was restricted to using conventional transport methods, mainly over land, to bring in new troops and provisions. If those routes could be choked off, the very rapidity of the Brazilian advance would be its own undoing; they would use up their supplies rapidly and be vulnerable when no more were forthcoming.

The strategy was old. The new wrinkle was the Door itself. With virtually instantaneous transit between two points, they could accomplish things that had only been strategists' dreams in the past.

The runner came from the hastily arranged command post down the corridor from the Door. He dodged a crate full of medical supplies and came to a stop face to face with Lister.

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"Sir?"

Alan Lister turned and smiled tiredly at the young man. "How many times do I have to tell you to call me Alan?"

"Sorry, sir . . . I mean Alan. Uh, they want you to pick up Charlie Two now."

"Seems like we just dropped them."

The runner glanced at his watch. "Forty-seven minutes ago."

"Any casualties?"

Involuntarily, the youngster grinned. "No, sir. Not a one."

"So we're just taking them home?"

"Fort Bragg, sir. They need to get some sleep. I gather they're going to be busy again tomorrow."

"Alan," Lister reminded him.

"Yes, sir, Alan."

Lister shrugged helplessly. "I can't get you to do it, can I?"

"Force of habit, I guess."

Lister sighed good-naturedly. "Pick up Charlie Two and take them home," he repeated. "All right, let me go tell Jenny."

Her reception towards him was considerably different than it had been earlier. "Who and where and where to?"

"Charlie Two . . ." he ran a finger down a marker board propped against the wall of the control booth and called off the coordinates. "Take 'em back to Bragg."

She nodded. "Can do."

He turned to go, but stopped when she said, "Alan?"

"Yeah?"

"About what I said earlier . . . I'm sorry."

"No problem, Jenny."

"I mean it."

He smiled in understanding. "I know."

She tried to smile back. "We're saving some of them. I feel like I'm accomplishing something worthwhile."

Anne burst through the control booth door, arms laden with containers. "Coffee, anyone?"

Alan said, "You should be in bed, babe. It's late."

She looked surprised. "You think you're telling *me* something?" To Jenny, she said, "Want to take a break? I'll run the Door for a bit."

"Let me make the pickup—it's rough terrain, and controlling the singularity will be tricky. I'll let you take them home."

Anne grinned saucily. "I know enough not to be insulted. I've watched you feather this thing in enough times that I've acquired a healthy respect for your ability at the controls."

"You're learning fast. I just want you to get some more daylight practice before doing a night drop." She turned to the controls and set the coordinates for the pickup. As she slapped the key to initiate the singularity, she said, "It would be nice if we could take time out and rig an automatic circuit to handle all this. Things would go a lot faster. As it is, we have to home in on a radio beacon on the ground. Even then, we tend to drift a bit."

Anne held up her hands. "I'm not arguing. Let's just get the job done. We'll fine tune the process as we go along."

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"Let's hope this is over before we have a chance to get good at it," Jenny replied.

It wasn't fair.

Commander James Hoffman stood in an unmarked warehouse on the Naval base in Charleston, South Carolina. Before him, half covered by a tarp, was the front end of a car. A Ford. The physical embodiment of his ill fortune.

The Navy, after bitter infighting with the other service branches, had won the Door project. It was to be a crash priority program. The Navy had placed the project with NAVELEX—Naval Electronic Systems Engineering Center—in Charleston, South Carolina.

It should have been easy. Knowing that something can be done is half the battle. They had indeed managed to create a Holmes singularity. *Controlling* it, however, had been their undoing. It flew about like a thing possessed. For reasons that they did not understand, it tended to home in on electromagnetic fields. It was drawn to them as a moth is to flame.

The remnants of the car in front of him had been the result of their third test run. They had tried to place the Door singularity in an open field west of the city. Before they could shut off the power, it had whipped across the field, drawn to the electric field thrown off by the drive motors in a car—this car. The driver had lost his legs as a result, leaving NAVELEX with a grisly souvenir that they could not admit to having.

The next day, they had tried again. This time, they had set the singularity to appear in midair. It had seemed safe enough. They had checked scheduled flights and found a time slot when nothing would be in the area. Needless to say, Murphy's Law dictated that a commercial jet had been late on takeoff from Charlotte. The singularity had swooped in on the jet from behind and devoured it.

But the jet, unlike the car, had not come to rest in the underground bunker where they had set up their test rig. Such a huge mass had overloaded the circuit driving the singularity. Voltages had spiked as the regulators in the power supplies failed. Oscillations had raged through the circuits in the scant seconds before they burned out, creating an echo, an uncontrolled mirror image of the Door. The jet had passed through the Door, then through its doppleganger, a distance of only centimeters. Then the Door system had failed utterly, leaving stunned technicians staring at smoking metal fragments dropped by the plane as it passed through; the Door had not been large enough to accept the entire wingspan.

Panicked, Hoffman had called and spoken to the executive director at the airport, specifically requesting that anyone waiting to meet passengers from that flight be detained, held incommunicado. The airport administration had not understood the urgency of the situation and had not posted guards at the door of the room where the people were being held. The Navy guards he had sent hadn't gotten to the airport fast enough and a girl had escaped, simply by walking

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out, minutes before the guards arrived. She had called a news service. From that point on, it had been downhill, a public relations nightmare. In retrospect, it would never have worked anyway—there were too many other people who had known that the plane was due in, people he had no way to control. It was a case of bad judgment, pure and simple.

Working around the clock, they had rebuilt the electronics and were on the verge of another test when a tall, slender man had stepped from midair onto the front lawn of the private residence of the secretary of defense.

Walking slowly and with great difficulty, he had faced down Secret Service bodyguards assigned to protect the secretary, introducing himself as Alan Lister, the commissioner of Crisium, former Lunar colony of the United States, now declared independent.

Once face to face with the secretary, Lister had offered the use of their Door to the military for the duration of the war.

And Hoffman had become a man without a mission. Instantly forgotten.

No promotions, no recognition would come for the man who had failed to produce a Door for his country. But the thing that galled him most was the fact that it had been one of those skinny-assed Loonies who had pulled the rug out from under him.

A textbook example of cutting the supply lines: The first to collapse were the fast attack units at the front. Lacking ammunition and medical supplies, the Brazilian forces fell back along the flanks of the advance. Like a miser reluctant to let go of a particularly shiny bauble, they held Mexico City for as long as they could before retreating. The last night saw particularly savage fighting as newly heartened Mexican troops, aided by American and Canadian forces, took the city street by street, flitting from one burned out hulk of a building to the next.

Viewing the smoking rubble from a low flying plane early the next morning, a NewsNet reporter compared the ruins to the aftermath of the disastrous earthquake of 2017. As if in response, a mild tremor hit at two that afternoon, although there was little left to damage; few were hurt, as the civilian populace had already fled the city.

The Holmes Door was instrumental in winning the battle for Mexico City. Since the United States had stubbornly refused to formally declare war, the military leaders were fighting with one hand tied behind their backs. Unable to mobilize sufficient forces to take the Brazilians by brute force, they were forced into a leaner, more efficient mode of fighting, almost guerilla-like. Strategies based on deployment of thousands of men were hurriedly rewritten for less, then scrapped altogether. All told, fewer than two thousand men passed through the Holmes Door during the war. It was later estimated that they had been more effective than one hundred thousand troops deployed

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conventionally.

Once Mexico City was regained, the fighting took on a different tone. The aura of invincibility that had surrounded the Brazilian advance began to look rather less complete. Morale of the troops pursuing the Brazilians rose daily.

Tentative plans were made for the final assault on Brasilia.

Jennifer Holmes glanced back worriedly at the man at the controls of the Door. She turned to Alan Lister. "I feel like I'm abandoning my post."

He smiled. "I know. That's why I came to get you. You'll make him nervous if you keep hovering over him the way you've been doing."

"But he's—"

"He's going to be just fine," Lister finished for her. "He'll need some practice, true, but it will be all right."

Jenny blushed. "I . . . it's not fun, exactly. It's more like a feeling that I'm needed. Now, I'm superfluous."

He shook his head, laughing. "Is it not enough that you've changed the course of human history? Jenny, every new transportation technology has changed mankind beyond recognition. People started out on foot. Learning to ride animals made an incredible difference in how fast someone could go, how far they could go, and how much they could carry. The wheel was such a potent advance that it's still in use today. Boats gave us access to water. Planes allowed us to use the air. Rockets brought us here, to Luna. And there things have sat for the past century. Oh, the technology has improved. Cars are more efficient. Planes, too, for that matter. But it was time for a change. We *needed* a new mode of travel. It's time to conquer new worlds."

"That's what I had hoped," Jenny said bitterly. "I wanted people to use the Door for space travel, discovery—something noble. I didn't create the Door so people could use it to kill."

He rested his hand on her shoulder. "Give it time, Jenny. Throughout history, armies have been among the first users of new technology. As often as not, they were the ones who came up with it in the first place—peaceful uses came later."

She pointed back at the Door. "Part of me understands that it's just a tool, neither good nor evil. But it's hard to look at it that way when a man dies in your arms. My mind and my heart can't agree on this."

"Jenny, you've created a link that binds us together, regardless of distance. In the long run, I think you'll see that your Door is capable of far more good than evil."

She sighed. "I suppose so. I just . . ." She shook her head. "Too much idealism, too little common sense."

"Too much common sense can be a problem, too. If you had listened to your common sense, you'd never have created the Door. Who'd believe you could walk though thin air and pop up a quarter of a million miles away?"

They walked in silence for a moment. Then, musingly, she asked, "Remember back when I was working on oxbow universes? I gave up because my common sense took over and told

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me that what I was trying to do was impossible. That thing with the jet down in South Carolina made me take a fresh look at some of my assumptions."

Lister blinked. "What did the jet have to do with oxbow universes?"

"Notice that there's one glaring question that no one has been able to answer. If you put a plane inside a rock formation, where does the rock go?"

"So you're saying that the rock went somewhere? To one of your oxbow universes?"

"I'm not sure yet. It's something I've been working on in my mind while I've been driving the Door the past few days."

Lister took a deep breath. "Do me a personal favor. Don't spring anything new on me until the war's over. I don't think I could handle it."

She laughed, more naturally than she had in days. "Oh, it'll take a while to put this together—at least another week or two."

Owen Rivers sat on a dock in Charleston harbor, staring moodily at the Cooper River. Ten minutes earlier, a man had left him. A man by the name of Hoffman.

The call had come as a surprise. He had barely gotten his morning coffee poured. There was no video to accompany the voice, which set off alarm bells in his mind. This was a man with something to hide.

The voice had offered to give him certain facts in return for his cooperation. By cooperation, the voice had explained, he meant that Rivers would quit digging into the case of the Ford's missing front end.

Rivers had been noncommittal until the man had identified himself as being with the Navy. That had piqued his interest, the Navy having been behind the incident with the plane. Was it possible that they had had something to do with the car, as well?

Now, an hour after Rivers had slowly walked the length of the dock to where Hoffman stood, he had answers to his questions. Most of them, anyway. For the rest, he could read between the lines.

The only catch was that he couldn't do anything with the knowledge. He couldn't close the case, at least not officially. Hoffman had pointed out the fact that the information he was about to receive was classified, and that the Navy would not look kindly upon someone who let out military secrets.

Caught between a rock and a hard place.

It wasn't that he had even been that close. The Navy had simply been afraid that he *might* stumble upon something damaging. They had been burned badly enough over their ill-advised attempt to cover up the loss of the plane. They certainly didn't want to go through that again if they could avoid it.

Rivers sighed. At least his curiosity had been assuaged. And his professional pride.

He didn't believe in so-called Acts of God. Things happened for reasons. Nice, tidy, logical chains of events led to observable end results. The missing front of the car, however, had

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tempted him to consider divine intervention. Now the case had come firmly back to Earth, and he felt relieved.

Levering himself to his feet, he gazed out across the water to the east. Somewhere out there, roughly five kilometers past the mouth of the harbor, the front of a Ford was attracting the curiosity of the fish. Keeping it around had been too big a risk, so they had dumped it the night before.

Somehow, knowing where it was, even if it was a long ways from the groove in the pavement out on I-26, made him feel better. Rationality once again ruled the world. Things made sense again. And if he couldn't write it up . . . well, that was just the way it would have to be. ■

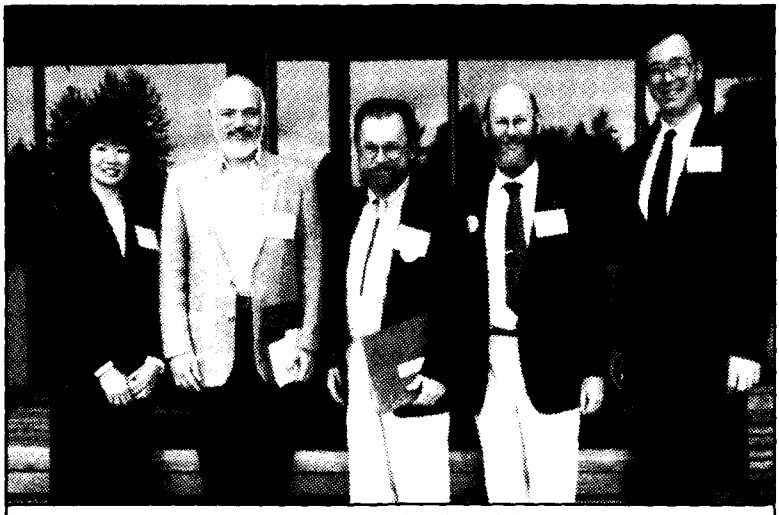

Photo by C. N. Brown/Locus

Left to right: Tina Lee, G. David Nordley, Arlan Andrews, Stanley Schmidt, and Christoph Haas-Heye.

The Analytical Laboratory awards breakfast was held at the Valley River Inn in Eugene, Oregon over the Nebula Awards weekend on April 23, 1994. Joining us for the gala event were G. David Nordley, whose story "Into the Miranda Rift" won for best novella/novelette, and Arlan Andrews, winner for the best fact article "Single Stage to Infinity!"

Unfortunately Stephen L. Burns, author of the winning short story "White Room," and artist John Maggard, whose October cover was voted number one, were unable to join us.

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THE ALTERNATE VIEW G. Harry Stine

THE BRITISH COLONIAL SHIPPING BOARD

The writing or presentation of a scientific paper is always accompanied by footnotes or references. A person is supposed to cite appropriate data sources so that readers can independently check the findings, hypotheses, or conclusions.

How many readers do check the references?

In the highly specialized areas of a given scientific discipline, I would estimate that readers who are working on similar experiments or in the same field may check the references. On the other hand, they may already have read them. However, egos may be so strong that the references are *never* checked because this would be a tacit admission that the reader doesn't know what's going on. Footnotes and references therefore serve only to lend an air of authenticity to the work. They may be the modern equivalents of the beautiful illustrations on medieval illuminated manuscripts. They are for show, not for blow.

The citation of references may become critical to the course of a debate, whether the argument takes place verbally in a public forum or in print in the various news media (which are not public forums; "Letters to the Editor" are *always* screened, usually trimmed, and sometimes rewritten, thus eliminating the consideration of news media as public forums dedicated to the free exchange of ideas and viewpoints).

The tenor of the moral times being what they are and the desire to win being given top priority in sports as well as intellectual affairs, I have known cases where references and footnotes are purely fictional.

In writing fiction, a tacit agreement exists between the author and the reader. The author says plainly, "This is all a figment of my imagination. Don't believe it." The reader accepts that.

Except that some readers don't. The fiction becomes reality to them because the imaginary world seems like such a nicer place to live than the real world.

Think not? You haven't been to a

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science fiction convention, have you? A stock clerk at K mart suddenly reveals a persona as the White Warrior of T'ilgath, wearing a sword he would *never* think of using in the real world (because he doesn't know how and would be sickened by the result). The Superman Syndrome is deeply entrenched in the collective psyche. No, I am not neglecting the female side of the house here. The ladies have their own fantasies, some of which are delightful, others not.

Some scientists, engineers, politicians, environmentalists, and business people also have their own fantasy worlds. Like science fiction fans, they often live there full time.

This can be discovered by exercising a business school technique known as "due diligence." This is the sort of thing that bankers, venture capitalists, investors, and business people are *supposed* to do. Some do. Some don't. And some therefore are hoist by their own petard whether they do it or not.

Why? Because data, references, and other "facts" can be generated and passed off today as real. We are overcommunicated, as Hugh Downs pointed out back in 1972. We are swamped with wall-to-wall data, and we haven't got *time* to check it all out. In science or religion, we are forced, often by circumstances, to accept data on blind faith.

"Due diligence" means checking the data, doing the thorough background check, pulling a D&B, looking at the annual report and the 500K, and just asking a few "embarrassing" questions here and there. This happens to you when a car dealer pulls a credit check on you, which is all the due diligence they have to exercise because they can always repossess the chattel.

I know one author who was on the collegiate debating team. He found himself in a tight bind during a debate. He was being assailed by impeccable logic from the opposition, and logic alone looked like it was going to win the debate. So he interjected data from the British Colonial Shipping Board. He won the debate.

The opposition couldn't refute him because they didn't know about this "data," couldn't look it up in time, and later couldn't find it anyway for a very good reason:

The British Colonial Shipping Board was as fictional as some of his later novels. So was the "data."

Unethical? Yes. But his school won the debate.

That was only an intercollegiate debate. But I have a suspicion that some other debates of a far more serious nature and wider actual impact may be interjecting data from the equivalent of the British Colonial Shipping Board.

No one checks out the references any more.

No one has time to do so.

We are so over-communicated that it becomes difficult to find the reference unless you have access to an outstanding public library or that of a large nearby university. Even if you have access to perhaps the largest repository of data in the world, the Library of Congress, can you *find* the data in the time you have available to

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do so?

Since this isn't a controversy-specific column this time, I won't muddy the waters by exemplifying a given subject. However, what do you do when the air-head anchor on the TV news reports that "nine out of ten" people do this or have that or suffer from the specific malady? Or when statistical data is reported without reference? Answer: You accept it at face value because (a) you're not really interested, (b) you don't think it affects you, or (c) you don't know where to start looking for the reference.

As a result, the data quickly becomes "everybody knows" data because *no one has bothered to check it out.*

I try to do so if it appears to me that the data refutes something that I've tested, know from experience, or have other conflicting data.

It's surprising how much of the reported "data" turns out to be opinion masquerading or being reported as fact. Then I usually have a very difficult time in the "Alternate View" department when I call the hand.

I normally don't cite all the references I have for two reasons: (a) the page space for this department is limited, and (b) most readers don't care because I am doing my job and providing a think piece disguised as entertainment. Those who do want to know my references will write me, enclosing a SASE, and I respond by citing references. I will absolutely guarantee and warrantee that I have *never* quoted the British Colonial Shipping Board or its equivalent as a source. Reason: My degree may be in science, but I have proudly worn the title of engineer who *must* make things work properly in the real Universe with no room for speculation. It's not nice to fool Mother Nature; it's impossible.

However, some readers who pick a fight will cite their references, and I always check these. After all, I am not omniscient, and I could be wrong. When I am, I will say so because I have known some *real* scientists who, when faced with hard, contradictory evidence, have publicly changed their minds with no loss of status or reputation. (When the Viking landers reported the surface conditions on Mars to be different than what Dr. Clyde W. Tombaugh had written about for years, he looked at me and remarked, "Well, data is data. I was wrong.") In checking the references these readers have used to support their positions, I have found a surprisingly high percentage of them to be the equivalent of numbers from the British Colonial Shipping Board, opinion being reported as fact, hypotheses being treated as laws of nature, and speculation that has transmogrified into "reality."

It's like getting onto a hotel elevator during a science fiction convention and sharing it with Darth Vader. The fiction is as real as can be to the person under the black helmet and cloak. (Yet, as you recall, that imposing character turned out to be nothing more than an ill old man who depended upon "image.")

This particular column is therefore a polemic requesting that you be very careful in your acceptance of data

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that can be used to affect your life. "Question authority" means more than making life difficult for the top dogs. It includes the principle of questioning the basis for their authority, especially if they wish to extend or expand their power over you. This includes questioning the data, where they got the data, how they got the data, and how they massaged the data before presenting it to you so it supports their position and therefore their cause.

The facts. Get the facts. And make sure they are indeed the facts. If you can't check the data by running the experiment yourself, be sure then that you can rely on the personal integrity of the experimenter. The answer to the question of *why* the experimenter did the experiment is often as illuminating as the experimental results themselves!

As for questioning my sources and references, please do! I have no ideological axe to grind here except to ask you to come to the party with an open mind. I enjoy writing "The Alternate View" or I wouldn't do it. I enjoy getting feedback (but if you want a reply, please remember the SASE and allow six weeks or more for delivery). I can always be reached on Internet as gharry@bix.com. ■

With the near avalanche of technological progress, the horizons are nearly limitless for creating new scams.

Kelvin Throop III

We do not get good laws to restrain bad people. We get good people to restrain bad laws.

G.K. Chesterton

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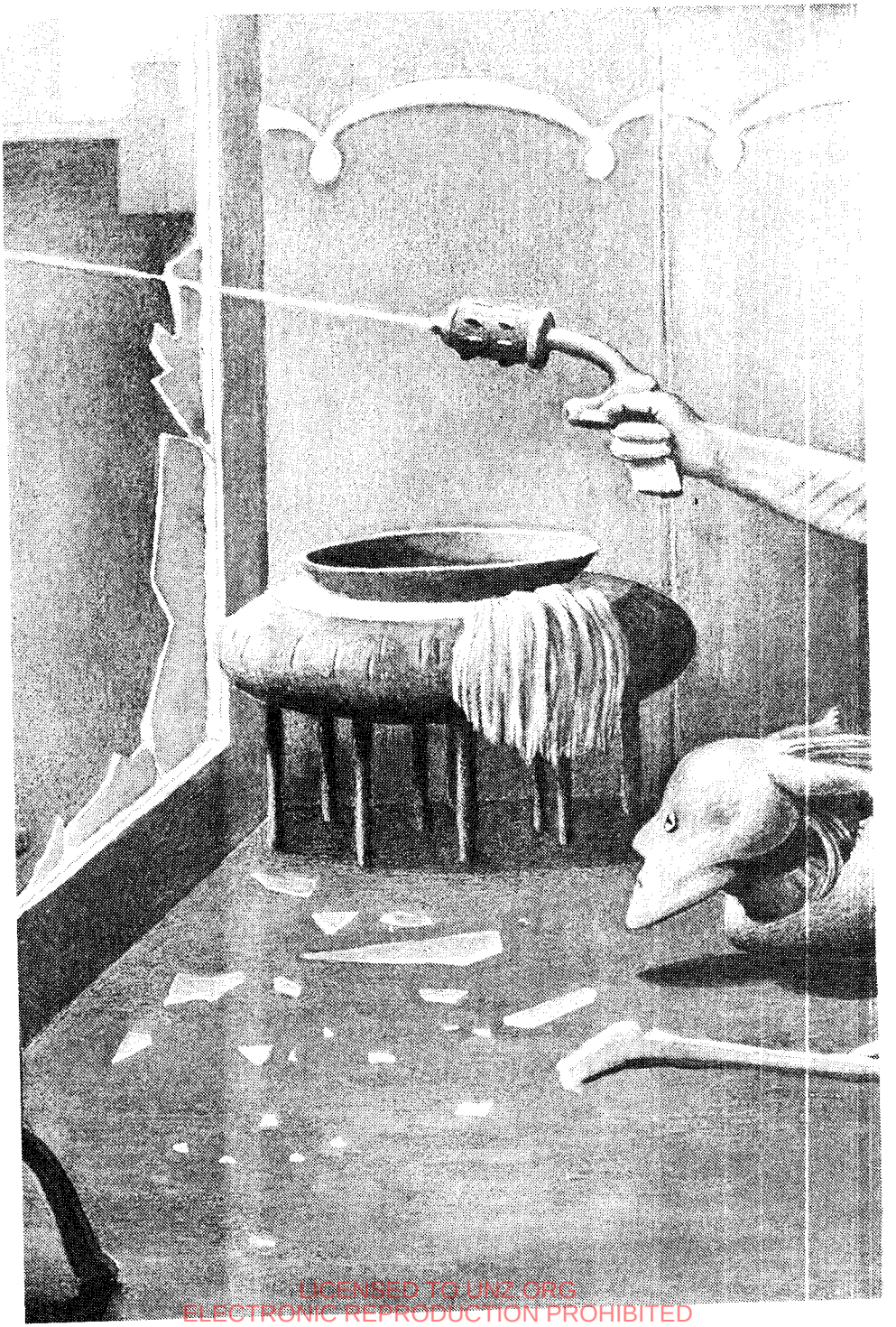

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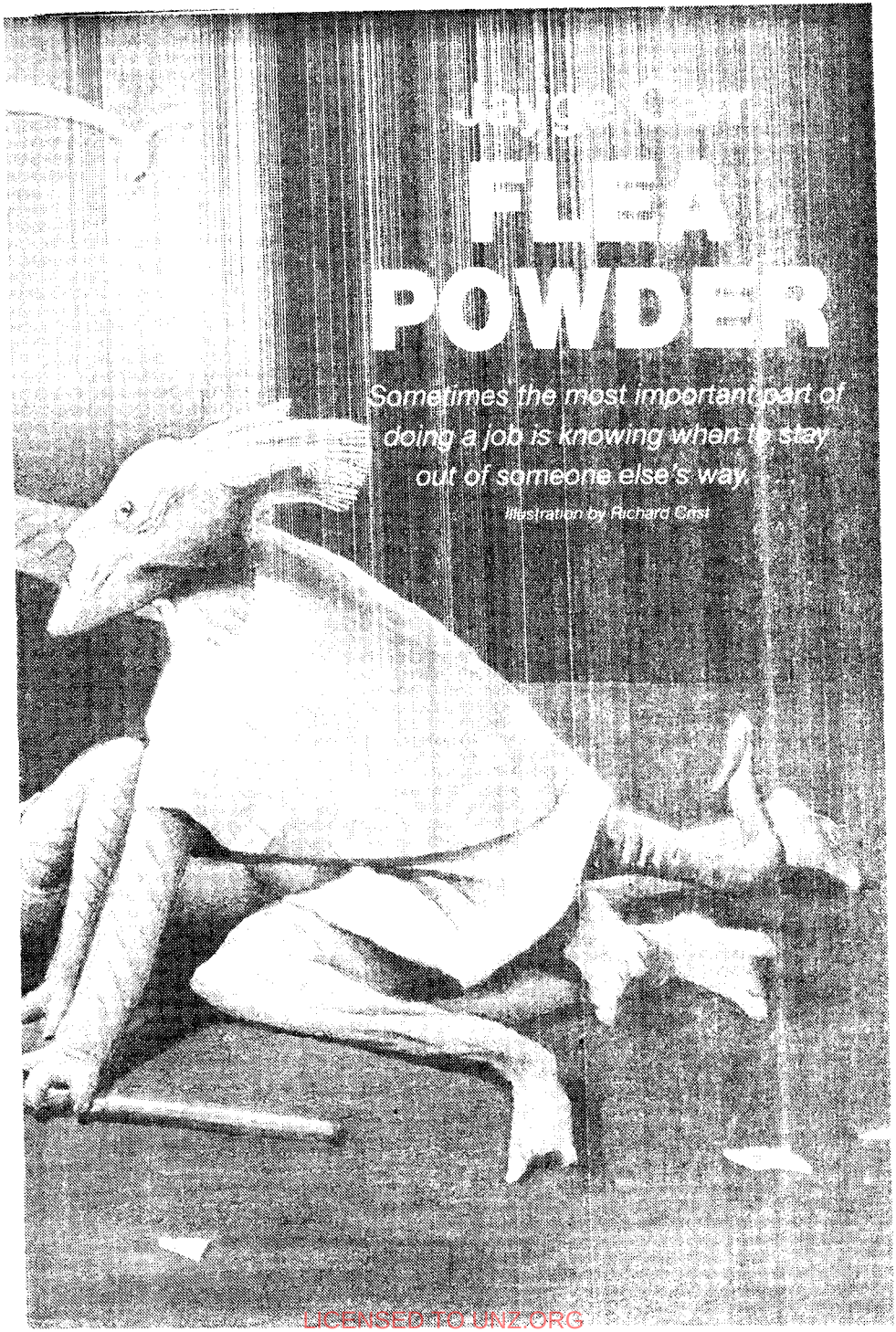
FLEA POWDER

Sometimes the most important part of doing a job is knowing when to stay out of someone else's way. . .

Illustration by Richard Crist



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Flesh bodies make me itch.

Not that I have anything against a temporary in a natural org, mind you. I can appreciate a soft breeze, or a starfall, or a groupsie as well as the next cyb. Nonetheless, flesh bodies make me itch.

I was encybbed in a real beauty, a light-class Star-Dancer, over ten to the thirteenth Hydrogen one radii of sleek engineering, hottest legs available, double-hundred interface and every one connected, frolicking along and filling my cargo holds with some of the sweetest rares going when the call came.

I ignored it.

But whoever it was was stubborn, and had my private address code. It's hard to keep ignoring a direct-to-brain input that can't be turned off and seems as loud as a meteor crashing into a planet not quite on top of a natural ear. So I acknowledged.

Jolly, it's about time, accused the mind that touched mine. I knew who it was, of course; minds are totally individual, and my association with Tango goes back to memories I've long since edited out. I knew my old pupil was way far away, too, from the out-of-synch flavor. I tried to explain to an anti-cybber once, who'd never experienced mind-to-mind inputs, how a cyb can tell distance in a mind touch. I had to fall back on the hoary old wheeze, about immersing in a multisense piece a little out of synchronization, so that acceleration pressure comes before the gauges show take-off, or sounds come after doors close and the like. I don't think I got the point across, but any cybber or direct input type just knows. Tango was wallowing out, way, way into the fringes.

You know, I grumbled, *used to be when a person put out a Leavemebe signal, they could depend on their friends to—*

Jolly, come quick, there's a problem!

Oh. Nova it, that was different. *Where are you? How far?*

We compared coordinates, and even at my top ratio, it would take me over five Half-Lives of Copper 67 to get there. (I cheated a little, too, stopping off to swoop around an unusually lovely rainbow system, and then wasting a few HLs of carbon 11 by side-tripping in a twinkle cluster, storing the sensories in my banks for more leisurely appreciation later.)

My destination was one of the dullest, most ordinary systems I'd ever seen. One, count it, one sun, an assortment of planets in a standard pattern including an asteroid belt in the warm zone around the sun, and the usual frozen cometary ring. The only ringed planet (I adore ring skimming!) was too far out to get enough sunlight to be interesting. I did a file search but I'd never been to this system in person before, and none of my traded-for files had anything on it either. (Cybs are always trading files with each other; it's a big universe.) I thought, anyway. I didn't bother to compensate for big time changes, planetary evolution, long term star moves or the like. I might later, but for now—

I'd never known my usually placid

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friend to be so jittery. We rendezvoused, and Tango was wearing a sleek courier job, twice my legs and inputs but no cargo space to speak of—and I could almost see the field phase outer shell pulsing.

Ay, Tango, what's the worry? Your maintenance has cross-inputted, has it? You want me to give you an external going-over? There must have been someone closer, but what the Way, what else are friends for?

No, Jolly, I'm four significant figures on all circuits. But there's a BAD problem here, and I don't know what to do!

Totally odd. Tango is a top-efficiency cyb, who usually has no trouble picking the optimum flow-path. (Unless there was something significant in my culled memories. But then, even I must have been new-cybbed myself once, though I haven't bothered to keep it in my personal files. For that matter Tango could have been my dupe, plenty of cybs felt the urge to reproduce every so often. Our long term mentor/disciple relationship argued for it. But I didn't think so. We were more different than my much greater experience alone could account for.)

Well, youngster, tell me what's feedbacking you, and I'll help as much as I can.

I said it, and I was stuck with it.

I had pulled Tango out of a black hole once too often, and now I was going to pay the price for being Jolly Who Can Fix Anything.

Natural bodies make my mind itch.

Tango had discovered a whole world of Nats. Not a group of anti-cybbers who were Natural by choice that traded components and whatnot with cybs, but a group of Uncontacted Nats.

Worse, a world of Uncontacted Nats on the verge of true ratiodrive. Now there's plenty of room in this Galaxy alone for worlds full of Naturals converted to cybs; when cybs find a new world of Nats, they either contact them directly if the psych profiles show opt, or leave them alone to develop star-cybbing by themselves. But these cuties were well on the way to developing star-drive without cybbing. Cybbing usually comes first, but what the Way, there are many paths to the same goal, and these babes were almost ready to shoot out among the stars in natural bodies encased in ships.

And they were warlike.

Bad.

Cybs can usually defend themselves, but few cybs are naturally aggressive. What for? There's plenty of everything to go round. Most cybs prefer to trade honestly for what they want (replacement parts, files of unexplored areas, whatever) rather than try to be grabby. Besides, it's too easy to crash somebody, the way we're always sharing stuff around. Cybs are the most independent—and interdependent—individuals ever developed, I think. Effectively immortal, too, as long as we clean out our files every so often, and transfer into fresh cyberbrains when the bonds start fraying. But a cyb can die just like anything else. Deratio too close to a star, for example, and it's

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goodbye cybbie. Oh, most cybs dupe every so often, but passage of time and different experience make the dupe a different indi altogether. So death is death, even for a cyb, and technically primitive or not, I'm not sure who I'd wager on, between a cyb and a shipful of these warbabies.

Something had to be done, and fast, before we found our comfortable galactic neighborhood contaminated by these shoot-first-second-and-third-Natties-come-latelys.

So here I was in a natural organic body—and *itching*. Could hardly think straight for that urge to scratch. What I really wanted to do was debody and encyb and shoot at highest ratio out of this place, warbabies or no warbabies. After all, ratiodrive or not, we could always throw a Quarantine ring around the local sector, warning everybody to stay away until these infants grew up a little.

Trouble was, with ratiodrive, no telling where the little darlings and their long-range stings could turn up. So it was better to erase the menace before it became a Menace.

That was Tango's conclusion, and I agreed. Only Tango hadn't the vaguest idea of What To Do, and so had screamed for good old Jolly, question answerer, problem solver . . . and now, it seemed, Nattie tamer.

They seemed a standard organic pattern, biped, bisexed, sense organs concentrated on the head with org brain inside, assortment of colors and features. Nats, plain ol' generic naturals, except for their viciousness.

Or maybe that was standard, too. Put too many mouths on a too small world, and something has to give. Usually, it's the pops, spreading out peacefully in ratiodrive, joining the rest of the googools of cybs playing seine the universe. But sometimes the overpop comes first, and something has to give, and usually—

I saluted (in this culture it meant holding the one arm out straight from the shoulder, elbow bent so the forearm came up vertically, and hand held flat and facing the superior) and stared assessingly at the org standing in front of a large square of a transparent synthetic looking down on the org-hive they called their major city.

The nat gave himself (of the two sexes, he was male) another couple of breaths, and sighing, turned. Stared, one tufted ear pointing straight at me, the other closing. He was an org, I've seen enough of them, thick and somehow very solid looking. But inside that org body, a force of personality like few I'd encountered gave an extra glow like a sun's aura.

I tried to make myself as cipherlike as I could.

"Who are you? Where's Haken?" he barked, with just the slightest undertone of impatience.

"Regrets, lord leader." I kept my hand in the salute, though I could feel the muscles trembling, reflexive flesh body reaction. "Your assistant Haken has met with a slight accident. I am Jasso. The computer selected me as having the next best qualifications to assist you."

Of course it had. After we'd primed it a bit. Luckily, they had primitive

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computers here. There wasn't a low-tech computer built that a cybber couldn't play any games they wanted to with. Poor Tango would have more of a job infiltrating the other major power, since they hadn't advanced to computers much. But that wasn't my worry. I had to convince this org that he couldn't do without me.

'Course, making the computers spill his psych profile was a prime advantage. We used it to design this synth org body for me. But as I stood there, erect and trying to control instinctive tremors, I wondered. This one was a system-of-a-lot more than whatever the psych profile had indicated. He limped toward me, leaning on a cane, and I saw the twisted mess an early battle had made of one leg. He hadn't let them amputate, though they'd told him he'd die if they didn't. Then he'd fooled them a second time, when they told him he'd never walk again.

I was glad we hadn't used our first, simplistic plan. Tango had been totally in favor. This one standout org had all but united a planet split asunder by war, and would finish the job very soon. Eliminate him, and with any luck, they would fall back into squabbling savagery.

But, I had argued, suppose they don't. Suppose it's happened, they unite around his corpse. Can you imagine the havoc they'll cause? I had convinced Tango to dig a little deeper before we tried anything.

Now here I was, already having found the first datum, the incredible power of this org's personality.

He stood in front of me, glaring. "I don't need an assistant at all."

"No, sir."

"Or a bodyguard."

"No, sir."

"Or anything el—"

"LOOK OUT!" I hurled us both to the floor as the flash of concentrated energy sizzled the air where we'd both been standing. We rolled, but he, because of his greater weight, wound up on top. Even as I struggled to get my handweapon out, he had his and was shooting back in the direction the beam had come from. The synthetic square he had been looking through at the world outside was already mostly vaporized, leaving a huge hole ringed with jagged shards. There was a howl of pain, and a spinning figure hurtled past the emptiness.

I scrambled to my feet, but his cane, still in his off hand, tripped me. "Young fool! Suppose there's more than one."

I knew there was only one, a programmed fake-org Tango and I had whipped up, but *he* couldn't know that. I crawled rapidly toward the opening, angling so the wall protected me as much as possible. When I got there, I cautiously stuck enough of my head past solidity to see out. I glanced around and said, "Don't seem to be any more, but you stay there until I can call security and be sure."

"Ump. Call security? They should have come as soon as the window broke and the alarms sou—"

There was pounding behind a closed entryway, and it burst inward. Security had arrived. Too late, of course. They almost skewered me be-

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fore he could stop them and tell them the attack had been from outside. As it was, they were dragging me away, struggling valiantly, before he could say any more.

"Stop!" It was all he said. All that was needed. Six security types froze, their hands on various portions of my flesh anatomy. I was almost sorry he did it. By the Circle of Stars itself, it was the first time I had been enfleshed that I had found something that helped the itching.

"Sir!" What was evidently the squad leader, a tall and lissome female that made my male body (this was a theoretically egalitarian society, but we'd decided that putting me in a female body and close to the leader might complicate what I had to do) itch in another way, saluted and froze, awaiting orders.

"He helped defend me," said the leader in a low but firm voice. "The scum who attacked me fell. Find the body, and see if you can get a clue from it."

"Sir!" The security squad leader straightened her arm as if pointing from the shoulder, and then saluted again. "Suppose the filth managed to drag itself away?"

"I shot the attacker, squad leader."

"Oh." She was almost smiling. "Did you leave enough for us to analyze, sir?"

His face was totally blank, yet somehow he had returned her smile without smiling. "I tried, squad leader. Go see if I succeeded."

Again she straightened her arm and returned to full salute position. "Sir." Then, with the effect of a cybber about to face a nova, "If you would permit me to keep my squad closer to you—"

It was as far as she got. "No," was all he said. I knew it was an old argument. He glanced out the . . . window. "And send somebody up here to replace that."

She about-faced, and her squad followed, taking me along, whether I wanted or not. Six times my mass dragging me entrywards was a potent argument.

"Leave him." However softly spoken, it was an order.

Hands dropped away from me.

His lips curled. Radiation blast me if I could have described the expression. But what he said was, "He can help protect me."

She turned, and her expression was plainly readable. *You'll have to protect him.*

I had to suppress the urge to flip my tail at her. It was a totally instinctive reaction, from reflexes Imprinted in the body. I knew what it meant, too. Thinking it over quickly, I almost did it deliberately. Then decided against it.

I might as well have. She gave me a Look.

"My new assistant, squad leader. Better get used to him. Unless—" It was a question, directed at me.

I used another Imprinted instinct, my ears drooping and springing full erect. Then put it into words: "The medics won't say how long Haken will be in the hospital, or how much longer before he can be any use to you, lord leader."

"Do you know how to use a com-

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puter?"

Do cybs graze rares? "Yes, lord leader."

"Then come along." To the squad leader. "Go. Send me whatever information you can come up with as soon as possible."

"Yes, lord leader!" She snapped one last salute and led her squad out. I watched her rump working with total male pleasure.

The leader glanced down and behind me, and I followed his gaze. And saw, with embarrassment, that my tail was sticking straight out behind me. Again, an Imprinted body reflex, reflecting what I was thinking.

"Word of advice, son." His voice rollicked with amusement. "Let her make the first *and* the second move."

"Sir?"

"I'm not fool enough to murky the air with emotion when all should be professional. But I know my people. She has more than her share of female pride. But—" Definitely a smile equivalent. "I understand that nobody lucky enough to be one of her chosens has any complaints, afterwards."

"Uh, yes." My tail was sticking out so hard it almost hurt.

He tweaked the tip of it. "To business, son. Get your mind off female twitches, and onto work."

"Yes, sir."

Work was sitting in front of a computer. I appreciated that the chairs were designed to accommodate tails in any position, because it took quite a while for mine to relax back into limpness. And the itch was fierce.

But I was soon immersed in what I was doing. It was . . . a long discussion on war, not just the moral aspects of using force to take what someone else may have, but the economic cost, the biological destruction, the effect on the world itself, the—

Fascinating. I had thousands of selected wonderful works in my memory, and while I would never go so far to rate this the best, it belonged in the top ranks of moral philosophy.

For now, I was just going through it, correcting grammar and punctuation and spelling. Easy enough, since I had prepared myself by implanting all the data I needed on the local language, along with a lot of other subjects.

Incredible. Absolutely incredible.

I have absorbed a number of philosophies, or ethical systems, or what have you. This wasn't just a treatise on the morality of war, it was a summary of morality, period.

I quit fixing what needed fixing, and just kept on, totally enmeshed in what I was seeing, screen after screen. (Won't comment on the idiocy of using eyes to scan a screen instead of direct brain input.)

I don't know how long I'd been there, when a hand landed on my shoulder and startled me almost out of the chair.

"Lunch time, son."

I had forgotten that flesh bodies needed stoking at frequent intervals. An odd vertigo when I tried to stand up reminded me. But soon I was putting my flesh body around nutrient. I didn't know what it was, but my

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mouth seemed to like it OK, and it filled the sudden ache (now that I was aware of it) in my insides.

I was cogitating so hard about what I had been absorbing that his voice startled me into spilling the liquid I was conveying to my mouth.

"What do you think of it, son?"

"Why haven't I seen it before?" I asked before I thought. After all, I hadn't put in everything extant in the culture.

Again, a smile that wasn't visible. "Did you think it was Remaldorixal?" (That was the Main "other" culture, where Tango was. The hatred in this culture for Remaldor was incredible—blind, voracious, unending.)

"No, sir!"

"Think nobody as evil as the Remaldorixi could produce work like that?" he asked softly.

"Sir," I replied almost without thinking, "nobody who could produce That could possibly be evil."

His ears twitched. "I . . . see."

"Sir?" Again I couldn't help myself. "Why can't everybody see it? Sir? It would make . . . life so much better for all of us."

"All of us," he asked softly. "Including the Remaldorixi?"

From my imprinting: "The Remaldorixi are scum!" Then I took a deep breath. Trying to integrate what I had had Implanted, and what I had just absorbed. "The Remaldorixi . . ." He was watching me closely, as I seemed to struggle with these "new" concepts. "Sir? Do the Remaldorixi . . . count?"

"Son, suppose you had a Remaldorix right here, now. Suppose you stuck a knife into him or her right up to the hilt. What would happen?"

That had to be the stupidest question in the Universe. When you cut a flesh body—

"Go on. Tell me. What would happen."

"Well, I'd make a big hole, and life fluid would burst out."

"Would it hurt? The Remaldorix, I mean?"

"It would probably kill, if I thrust hard enough, and deep enough."

"Kill. But would it hurt first? Would the Remaldorix scream, or writhe in agony, or plead for its life?"

I made the ear gesture that means, Who cares. "All three, probably. They're not just scum, they're cowardly scum."

"How many Remaldorixi have you known? Personally?"

I dug through the bio we'd made up for my fake identity. My persona had fought in a couple of very big battles. Oddly, the few survivors of his group had all died in a flyer crash after the second. (The flyer crash was real, that's why we'd picked the squad we did for the fake background.) My persona had survived because he had stayed behind; we'd whomped up a good reason. But no, except in battle, he hadn't met any Remaldorixi. "Not any, unless you mean in battle."

"Did you think they fought like cowards, in battle?"

"No. But—" I knew the propaganda. "My battles must have been exceptions."

"No, son. No. Except that their ears are much rounder, and their noses broader, and they tend toward light

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colors in their stripes, Remaldorixi are just like us."

I made myself gasp. "Isn't that treason, sir?"

"It's a physical fact, son."

"Oh." He was the leader, and I was doing my best to project myself as young, naive. Not that hard, since none of this was more than a recent implant. But an old cyb like me has seen most of the Universe, and there's very little new.

He breathed out, an odd sad, hopeless sound. "Never mind, son."

We finished eating in silence, and I went back to working on this strange computer file.

I got in touch with Tango the first sleep period I had. (That's another idiocy of natural bodies. Why can't they just take a flush to get rid of accumulated poisons? Noooo, they have to spend a third of their lives semi-conscious, letting their organisms get rid of what could be taken care of in a flash, with proper systems.)

What are you doing, Tango?

Translating a sort of morality discussion into Maldorit.

I was so surprised, I had trouble looking like I was sleeping. *Tango! I'm working on a similar treatise. Is yours mostly about war, with lots of sidebars into how to treat other people, singly and in groups?*

You mean you're translating something out of Maldorit?

No. I'm just doing some small editing on my file. Spelling and the like. It's in Javenesk. Do you think it's the same file, Tango?

Be a funny coincidence if it was. Yet . . . if I have more fuel than I need to get around and keep me warm, and you have more food than you can eat, and we war, and you win, you have more fuel and more food than you need, and I have nothing. If we trade, we both end up with what we need. So why is war a solution to a scarcity?

That's it! That one idea is the heart of the war section, the rest is just, well, explaining and extending.

Ahh, Jolly? I think we'd better not even think *of meddling any more until we dig a lot deeper. Something very Odd is happening here.*

Yes. Though I didn't say so to Tango, I had a strong suspicion who the originator was.

My suspicion grew to almost certainty a couple of days later, when he kicked me off the computer to make a few additions to the file.

I knew this was It. The way to turn these warbabies into civilized folk. Only . . . how was he going to make the rest of them accept it?

Tango still wanted to kill him off, and solve the problem that way. Remove the linchpin, and the "world order" would collapse back into splinter fragments.

I said No. Wait and see.

Time passed. Until we had spent much longer on this world than either of us had anticipated. Tango began to sulk. Especially about not wanting to miss an imminent rendezvous, a Thrills-and-Chills halfway across the galaxy with a merry group of cybbers, including a favored

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partner.

As the deadline for making the T&C opener crept closer, Tango's constant theme became: With The Expert on the scene, The Mere Assistant is unnecessary.

I began to agree. Better no helper at all than an unwilling one. One world only needed one cyb to adjust it.

Finally, I told Someone to go play and leave this problem to those equipped to deal with it. (I didn't specify mentally, but any cyb can fill in between the screens.)

More eager to head out than to argue, Tango scooted Centerward at full ratiodrive. The warbabies were all mine.

I did what I had said over and over was The Right Thing. I waited.

The war leader kept making small corrections to the file, until finally he just read it, over and over.

Sometimes he questioned me again. In a way, answering him was difficult, because my own answers were the exact opposite to the answers my native programming demanded. A sentient, after all, is a sentient, no matter what color their stripes are. After all, *most* of the sentients I know off this world have no stripes. Most have, for that matter, no flesh bodies to have stripes on.

But as I continued to work on and absorb the file, I found it easing the programming, so more and more I could simply answer naturally.

Of course Remaldorixi would feel pain if I stuck them.

The day I could say it, easily and truthfully, was the day he closed the file, as it was.

Also, though I didn't know it until later, that was the day he started setting up the Final Peace Conference.

He kept me too busy to worry about security, and that wasn't my job anyway. But when I found out what he had in mind, it totally appalled me. Killer understatement. Or maybe, just plain killer.

I doubt there was any race of Nats anywhere, except the cave types perhaps, who don't have some equivalent of an arena. This org-hive had one, used for war games, the kind that half the pops come to watch in person, to see how well the troops are doing. It may have originally been designed for more peaceful sports but who knew.

It could hold a generous fraction of the pops of this org-hive. A large fraction.

It was going to.

He was going to be on stage. Plus two huge screens, one on each side of the platform, each holding the main top Nats of one of the respective cultures. A third screen behind showed the audience a similar arena in Remaldor, showing the Remaldori leader, on their stage in that arena.

I argued until my tail drooped between my legs. I could have saved my energy. The only concession he made was that I could be on the platform with him. But not too close.

Not too close. Of course. If assassins did happen to manage to smuggle a weapon in, no use giving them an extra free target, besides the top leader of the whole world, no my no.

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I couldn't believe it. But he was doing it. So, while he and his people were setting up his Idiocy, I was making my own preparations. All I could think of. Then I thought of more. Started processes I prayed to all Infinity I'd never need to depend on. Cursed and pummeled my brain and kept trying to close off all the loopholes. Knowing it was the one contingency you haven't thought of that does you in, every time.

There wasn't a wall anywhere near where I was, the next few cycles, that didn't have my nervous scratch marks.

There were only seven people on the stage, but hundreds crowding on each screen, and hundreds of thousands in the audience. A similar setup in the capital of Remaldor, held *their* leader, and security, with their screens showing *our* audience and the smaller screen on the platform, *our* leader.

Seven people on the stage. Him, me, the security squad leader and four of her people.

The Remaldori leader had an assistant also (not Tango's body, with a drone running it when I couldn't spare enough attention, but someone else) and a similar squad of security types.

But the security folk were merely for show. They didn't have energy weapons, or even the older, explosive propellant stuff. (I'd never even heard of those before coming here. Talk about primitive!)

No. They had ceremonial swords. Long sharp knives in fancifully decorated sheathes.

Oh so helpful if somebody in the audience pulled a *real* weapon.

I stood poised, ready to fling myself in front of him, if any weapon did appear.

He read the file, slowly. The other leader did the same, in their language. As if one was merely translating what the other was saying. Except I knew how much labor had been put in, to make this statement. I even knew what the other leader had contributed. I got that from Tango early on. Mine wrote stuff that needed translation. But the Remaldorix wrote a share too, which had to be translated into my language. Both of them had worked on it.

I knew whose idea it had been originally, though, and who had contributed the most.

He finished. The other leader finished.

"This," he said, "is how all of us are going to live our lives from now on. If nobody wants war, it need not be, ever again."

The other leader said the same thing, in Maldorit.

"I agree," said our man.

"I agree," said their man.

"Now," said our man, "you, all who are here, all who are listening, must also agree. You must—"

"NO!"

I whirled. It was the security leader. "No! We cannot trust them. You are a traitor!"

And something was happening on the screen, on the other platform. But I paid no attention to it. I was diving for him, to protect him from the dan-

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ger coming from the direction I had never expected.

"NO!" He put out a hand to shove me aside, but I was diving—

The energy bolt splashed us both. I screamed, I had never endured such a wash of sheer pain in my entire existence. He gasped and went limp.

I pulled myself away. One arm and part of that side was a mass of pure agony. But he had taken most of the blast right in the torso. My body might be fixable. (If not, I would survive, since if this body died I would merely return to my ship brain.) He was dying if not dead.

"You killed him!" I screamed.

"My country above all." She put the muzzle of the weapon in her own mouth and pulled the trigger.

"May your anima rot forever!"

"Son. . . ." It wasn't much more than a whisper, a breath, but I heard it.

I crouched, tried to support him, my good arm around the back of his body—even there I could feel cracked and burnt flesh. "Medic!"

"No." He looked up, into the camera. "Give my death . . . meaning. Make mine . . . the last death . . . in war."

"No*oooo!*"

"Accept . . . my covenant." He slumped against me. I knew a dead weight when I felt one.

One of the security guards came over, bowed. "I accept all your covenant, lord leader." Another came behind. "And I." The third, then the fourth. "And I." "And I."

It was the last one who turned to the screen with our own leaders, and said. "What about you?" Then to the audience. "And you! He *died* to give us peace. Will you not take his last gift?"

Somewhere in the audience, someone was shouting, "Peace! Peace! Peace!" Only it wasn't one someone, it was two . . . three . . . a dozen . . . a score . . . a hundred. Hundreds. Thousands. Emphasizing the single word with the stomp of feet. *Peace! Peace! Peace!*

There was a racket coming from the screens showing Remaldor. I realized that it, too, was a single word. Their word for Peace. I looked at the screens. Everyone was standing, stamping, shouting out the one word. Peace. Peace. Peace.

Except in the smallest screen. In that screen . . . ah, the sweet black of infinity! On the other screen, my opposite number was holding their leader, slumped and limp.

Both leaders. Dead. For peace. Killed by those closest to them, who couldn't stand the thought of ending war.

Yet those deaths would seal the peace, and the covenant, more than any other single act.

Pain was washing over me, and I gave into it.

My flesh Jasso body was damaged enough that no one would be surprised if it didn't survive. I left it completely, with enough circuits shut down that it would never regain "consciousness" and slowly die. I didn't even keep tabs to know when it stopped breathing finally.

But I didn't just go back to the ship

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and encyb. I returned to the ship, yes, but I entered another flesh body there, one of my preparations, that I had grown and kept ready, just in case.

Now I was hoping I would need it.

So I sat, enfleshed and itching, inside my ship, watching the dials, watching another newly decanted body kept alive by medic equipment. Watching that equipment slowly withdraw as the body integrated its own systems. Watching . . . and waiting. The question was. . . .

The eyes opened. Unfocused and wandering. Then they integrated, and intelligence glinted within them. "Report," he barked.

"How do you feel?" I said softly.

"Who are you? Report! What happened after I—" He sucked in air, on a gasp.

"They accepted the covenant." I gave him what I thought he wanted most, immediately.

"All of them?"

"All of them." He relaxed.

"Lesper?"

Took me a blink to remember that that was the Remaldori leader's given name. "Dead." There had been no way that I could have gotten close enough to that one to make a pattern, even if I had wanted to . . . and known it would work. I hadn't been sure it would work with my leader. But I had hoped. His force of personality made it a hope.

I reached out and touched his cheek. He jumped a little, and gazed at me though wide opened eyes. "Who are you?"

"Your medic, for now. How do you feel?"

He took a deep breath, I could almost see him testing out his body, searching for pain, or damage, or mutilation. Half puzzled, he said slowly, "I don't hurt." Another breath, almost appalled. "At all."

"That's good. That's what I hoped for."

"It's impossible," he stated bluntly. "Whatever happened on the platform, my leg always aches."

"Not any more. Ever again."

"Who are you?"

"My real name . . . translates as Jolly," I told him. Then, taking a risk: "You knew me as Jasso, before."

He took one look. "Impossible."

Well, Jasso had been male. But this body was female. "The first time I as Jasso met your security leader, my tail went so tight it took half a morning for it to loosen again."

His ears twitched. "That's the commonest male reaction."

"You told me to let her make the first and second steps. And that those lucky enough to have her choose them hadn't any complaints yet."

"You'd better explain."

My tail curled nervously. I took a deep breath. "It's simple, really. My people are much, much more advanced than yours. We can do things your people can't. One of them is . . . is move about from body to body. As easily as you put on a uniform and then change to another."

Clipped: "I don't believe you."

"We can. We do. Mind, soul, persona, identity, individuality, whatever you want to call it, is only a pattern,

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really. Such patterns can be reproduced, or moved. Just like you take a computer file and put it on a tape and then take the tape and put the file in another computer."

He didn't say anything. He didn't believe a word of it.

"I don't remember what my original body was like. I don't even remember how many different bodies I've inhabited—"

He froze. I remembered that his world, like so many others, had its legends.

"I can't enter an already occupied body. The body of Jasso, like the one I'm wearing now, was grown for the purpose. It never had a . . . a previous owner."

Silence. Unbelieving silence.

I decided to give him the works. "You died. The body your . . . your selfness was housed in died. But I copied your pattern, when I was working with you, and stored it. I wasn't sure if I could, without your cooperation, and without all the proper equipment, but your personality is so strong it worked. I had already grown a body for you, just in case."

His mouth worked. "Why do you lie? I know this is my body."

I had prepared for that. I held up a reflecting surface. "Is it?" He looked at himself.

"Yes!"

"Sure?"

He stared, glared. "I look . . . younger. Is that some part of whatever miracle treatment saved my life?"

"No. It's because I grew this body from some spare cells of yours, so it's an exact duplicate of your original. But I didn't bother to age it past maturity. Prime. You're a male in his prime again."

His mouth worked again. I tilted the surface, so it showed his body. He stiffened. The climate inside my ship was controllable to almost anything. So I hadn't bothered with putting clothes on him. Nor had I bothered—why should I?—duplicating the scars he had acquired in his first life. "Where—"

I kept tilting the mirror. It showed a smooth, unscarred body . . . two firm muscled, straight legs.

He sat up, felt the left one incredulously.

Finally: "I begin to believe. But why?"

"Why did I do it at all? Or why you?" I touched his cheek again. Touch is the most primitive of senses, but also the most effective. "It's the same reason. I liked you. I didn't want the waste your death would mean."

"None of my people ever got a second chance like this, did they?"

Infinity, the altruism of the man. But I had almost anticipated that, and I had an answer ready. "But I need you. I'm still so ignorant. I have only limited resources. Without your wisdom to draw on, how can I effectively help keep your people on the path you've started them toward with your sacrifice?"

"I see." He didn't accept it right away, of course. But it gave me an edge. I was a cybber, with a cybber's long, long-term mentality. Keep him busy helping his people, get him used to cybbing, pop him on occasion into a pure cyb, to do this or that—

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I had been a single cyb for too many long cycles. It was time I had a partner again.

It was even worth spending most of my time enfleshed, and itching. Besides, once I convinced him that emotions could strengthen a working relationship instead of just, as he had once put it, murky the air, he was a most effective scratcher. ■

(Biolog continued from page 69)

This transcendence came about for Jeanne after living in the vast woods near the horizon-stretching sea in Nova Scotia. She found that the study of Zen Buddhism could unite her with the immensity and power of nature. She has continued to study dancing at well-known schools, and has progressed beyond simply dancing herself to choreographing dances for many persons. This way, her visions reach a larger number of people, as they do when she writes them into novels. She thinks literally, as people more commonly did many years ago, of working with the Muses, *Terpsichore* of the dance, and *Calliope* of epic poetry.

Spider complains that dancing gets you applause quicker, as soon as you finish, but being lionized for writing takes years until your story is finally published. Jeanne counters that everyone only sees the finished piece of writing, but dancers and choreographers have their false starts and rewrites displayed in public before a production is finalized. It was only after becoming a writer, too, that she realized the choreographer was also telling a story, using a different medium and invoking a different muse. As a Soto Zen adept, she wants her dances to be visual *koans*, parables leading to visions of truth beyond logic. As a writer, Jeanne wants her dancing fingers to choreograph words into visions of worlds beyond the printed page. ■

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Rob Chilson & William F. Wu

FOR MANY SHALL COME IN MY NAME. . . .

Most technologies have many applications, both good and bad. And sometimes it's hard to tell. . . .

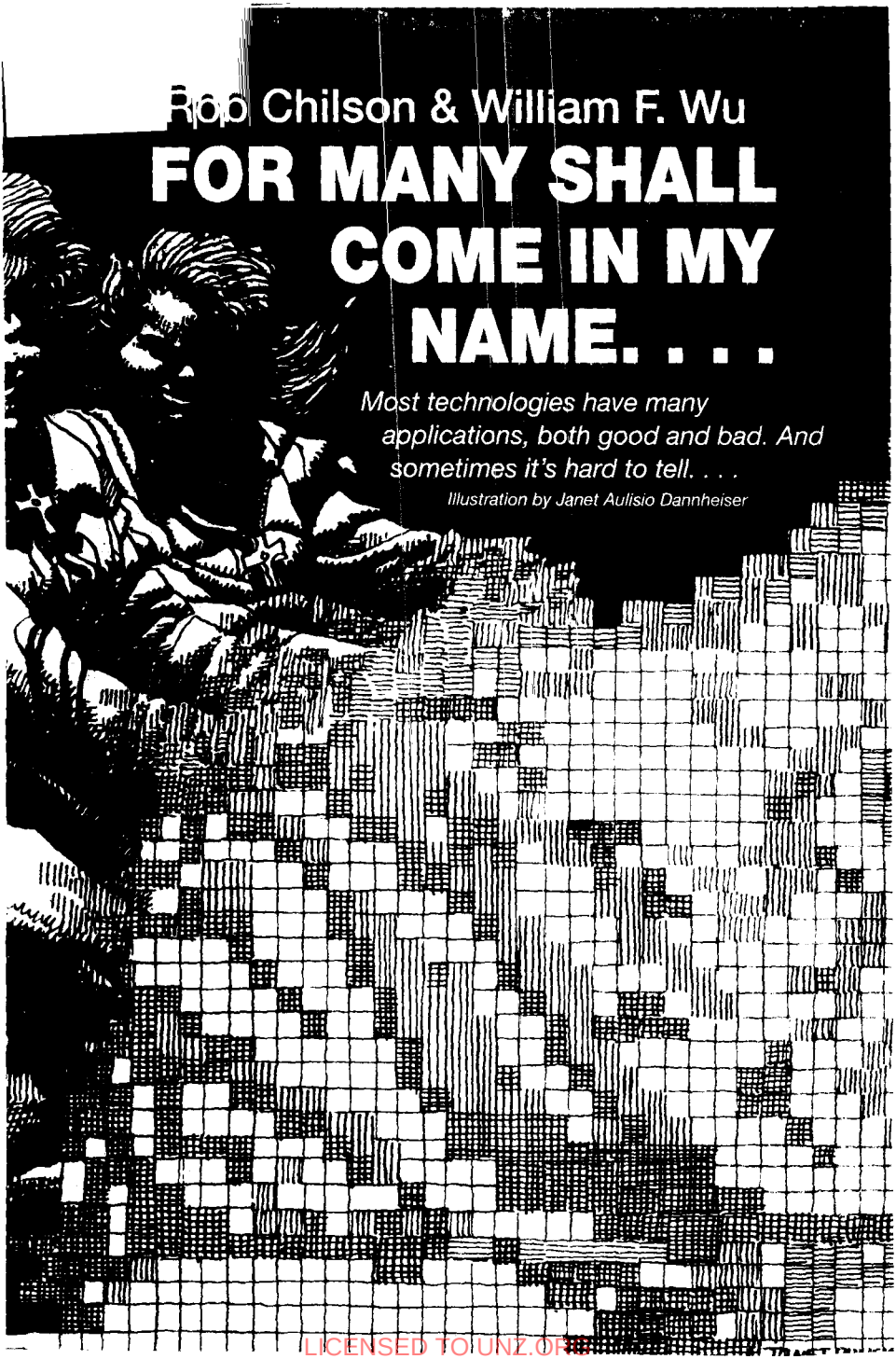

Illustration by Janet Aulisio Dannheiser

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Dave Kiefer sat deeply slumped back into his sister's soft, green and white flower-print sofa. The small living room in her mobile home was dimly-lit, the windows shadowed by the big trees all around it. The house was set off a gravel road in Missouri's southern forest. All he could think about was his six-year-old son, Trippy.

"Davey?" Kathy Bender, his divorced sister, came into the front door and looked at him. "Did Laura call while I was out? Is there any word about . . . Trippy?"

Dave hardly heard her. His wife, Laura, was with Trippy now in the hospital over in Poplar Bluff. Trippy had fallen out of a tree last week and was in a coma with severe brain damage. The neurosurgeon had told Dave and Laura that even if he came out of the coma, he would never be a whole boy again.

"No." He tugged his T-shirt down over his belly and started to take a drink to show her the beer can in his hand was empty. He let it drop to the floor, sat staring idly at the dark holovision.

"You thinking about what the doctor said? About having Trippy's brain cells regenerated?"

"No!" Dave's anger surprised even him. "They said it was experimental. My boy's not a guinea pig. And. . . ."

"What?"

"It just isn't right. It's God's business. Resurrection—if God wants Trippy t-to stay with us, He'll bring him around, without any fancy medical stuff. If He doesn't, who are we to-to—" He stopped, his voice cracking.

Kathy looked at him for a long moment. Like him, she was tall and a little too heavy. Her long hair matched his in color: blonde darkening to light brown. They came from hardy German peasant stock in the little Missouri town of Westphalia.

"Well, Rev'ren' Jason's coming on now," said Kathy, forcing false cheer into her voice. "Laura says you like him, too. I watch him every day, ever since I've been home on unemployment."

Dave said nothing.

Kathy sat down on the far end of the old sofa, her weight making it sag slightly. She aimed and clicked the remote control. Instantly, the living room brightened.

Dave blinked in the sudden light, looking into the interior of a large church, in fact gigantic—wider than that end of the mobile home. A man in a perfectly pressed blue suit strode across a dais in front of an altar, grinning at a congregation sitting in pews with their backs to Dave and Kathy.

"Welcome!" boomed an unseen announcer, as music rose behind him. "This is the First New Testament Gospel World Fellowship, hosted by Reverend Jason Matthew Wayne. Join Reverend Jason and his devoted followers in worship and praising God!"

"Good," said Kathy. "We skipped all the credits and junk and got right to the good part."

The shot closed in on Reverend Jason until he seemed to be standing about ten feet from them. He had a head of very full, wavy brown hair and a big smile with large, perfect teeth. His eyes were a bright, sparkling blue and he had a long, firm,

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square jaw.

"Welcome, friends," Reverend Jason called out in a resonant baritone. "I'm glad to see you today. Let's go straight to a tape of this morning's baptism in Jordan Brook, which runs right behind the Fellowship Church!"

The scene cut away instantly, to Reverend Jason standing knee-deep in a lazy, winding blue stream. His voice-over continued, introducing the two young women being baptized, while his image greeted them. Willows grew by the bank, trailing their green fingers in the water. The Reverend wore a plain back swimsuit.

Kathy whistled at him, then laughed. "Wow. Look at that."

Dave allowed himself a slight grin at her enthusiasm. "Yeah, he's in pretty good shape."

Reverend Jason had perfectly shaped and sharply sculpted muscle definition. He looked like a classic movie hero from some adventure film. Two young women in identical, modest white swimsuits waded out to join him, looking adoringly up at him. The Reverend placed a hand on each of their heads and closed his eyes to pray.

"They're cute, too," said Dave, just to keep himself involved in the show.

"Too young for you," said his sister, with a teasing glance.

When Reverend Jason had finished praying, he gently pushed both his companions under the water of the stream for a moment. Then they came back up, spitting out water in small, tidy arcs with their eyes closed and ecstasy on their faces. The camera cut back to Reverend Jason in the sacristy.

Dave got up and fumbled through the church scene into the kitchen. He knew that Kathy was just trying to get his mind off Trippy for a little while. Taking another beer out of the refrigerator, he decided he could humor her.

When he sat down again, Reverend Jason was pacing back and forth in front of the pulpit, but the stained glass windows behind him were overlaid by three holographic videos of Jesus healing the lame, the halt, and the blind. These scenes were based on famous ancient paintings, Dave knew.

Now the Reverend was speaking, waving his hands emphatically:

" 'The blind receive their sight, and the lame walk, the lepers are cleansed, and the deaf hear, the dead are raised up, and the poor have the gospel preached to them,' saith the Lord Jesus!" the Reverend boomed. "Matthew eleven, five," he added, sotto voce.

" 'Then he called his twelve disciples together, and gave them power and authority over all devils, and to cure diseases. And he sent them to preach the kingdom of God, and to heal the sick.' Luke nine, one and two."

The rising, urgent, exclamatory prayers of the congregants crescendoed, then the Reverend Jason came back again:

" 'Verily I say unto you, If ye have faith as a grain of mustard seed, ye shall say unto this mountain, Remove hence to yonder place; and it shall remove; and nothing shall be impos-

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sible unto you!' Matthew seventeen, twenty."

Two men carried in a sick girl on a stretcher, and in the animations behind the Reverend, others carried in sick people on cots. Reverend Jason bent over the child before him. " 'Suffer the little children to come unto me!' Now, my daughter, we will pray together." He closed his eyes and raised his hands, shouting aloud in Hebrew—according to the little scroll across the floor of the church, which translated it: " 'No man can do these miracles that thou doest, except God be with him.' John three, two."

"Arise and walk! Thy faith has made thee whole!"

And the child sat up, with the light of astonishment on her face. She beamed at the audience, then up at the handsome Reverend, saying, "I feel lots better now!"

The Reverend beamed back at her, the congregation cried "Hosanna!" Against the windows behind them, the animated lame, halt, and blind were rising and rejoicing also.

Under the stretcher, across the Reverend's feet, ran the scroll: "Simulated recreation of conjectural events described in letters to the minister."

Several more miracles followed, then more booming quotes from the Scriptures. Not a single moment dragged. Reverend Wayne's show concluded after thirty minutes, when the Merciful Sisters of Melody, three large but attractive women, came on and sang "What A Friend We Have In Jesus" with the Reverend. The congregation joined in, singing like a trained choir.

Afterward came the usual announcements: Join the Fellowship for special faxings, or the Reverend's Compnet service, or a Special Appearance in your own home! of the Reverend. A matter-of-fact scroll mentioned the modest fee that this electronic service required.

"Davey!" Kathy reached over and gripped his arm, hard.

Dave winced; her grasp almost made him spill his beer. "What?"

"Let's do it! Let's invite the Rev'ren' in and ask him about Trippy! It doesn't cost much— Maybe he could heal Trippy—!"

Dave hesitated. The Kiefer family had survived generations of oppression and poverty in Germany and America by the rule: don't attract attention. Disturbed, he looked at Kathy and saw that she was really into the idea.

"OK," he said doubtfully. He kept his skeptical reason to himself: I guess it can't hurt.

Eagerly, Kathy grabbed the unicom remote and punched up Reverend Jason Matthew Wayne's number. Reverend Wayne's operator-cartoon appeared in miniature over the combox, drawn to look like a plumpish middle-aged lady. "How can I help you, dear?"

"Um, we want—uh, we want to see Rev'ren' Wayne—a personal appearance. . . ."

"Oh, of course, dearie, and it so happens the Reverend is able to see you now." Her cartoon smile did not falter. "The donation to cover the communications charges must be

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prepaid. . . ."

"Oh, of course." Kathy hurriedly keyed in the transfer of funds from her bank to the Reverend's account.

"Thank you, dear!"

After a moment's pause, the door to the kitchen was blotted out by a large, green and white wing chair. With a swift motion, the Reverend hurtled into it, backside first, holding a Bible and hastily smoothing his full, wavy hair. He turned a bright smile on them.

Dave couldn't help smiling back and found himself warming to the man. Suddenly the idea of consulting him felt reasonable enough, since the Reverend was willing. Only a moment ago, the Reverend had seemed a remote figure.

"Hello!" the Reverend said brightly. "My operator tells me I'm being called from the phone of Kathy Bender, but she didn't give me any other information."

"Oh, yes, I'm Kathy Bender, and this is my brother Davey, Dave Kiefer. Um, what we wanted to ask, what Davey needs to know, is what to do about his son, Trippy."

Hastily, Kathy told the Reverend about Trippy, while Dave suffered silently. It all sounded so harsh and final, as she described the circumstances. What could this pleasant, well-dressed man know, what could he do that would help?

Reverend Jason turned his sympathetic, unsmiling gaze on Dave. "A terrible thing. I know how broken up you must be by this."

Dave nodded, feeling suddenly the smart of tears in his eyes, the heaviness of grief in his breast.

"What does the Bible say? 'I am the resurrection and the life: he that believeth in me, though he were dead, yet shall he live.' John eleven, twenty-five. But you must believe. 'Whosoever believeth in him shall not perish.' John, three, fifteen."

Dave couldn't speak; he could only nod to the truth.

Kathy glanced quickly at him, then looked back respectfully at the Reverend. "Yes, but what should we do? I mean, the doctors want to shoot these little things into him to grow his brain back, but we don't know. I mean, if it's God's will for Trippy not . . . not to w-wake up—" She choked and wiped her eyes.

The Reverend paused, then spoke with gentle reassurance. "Our most important prayer urges God to let His will be done. Not because He wouldn't otherwise, but to help us to become reconciled to the will of God."

"But what if Trippy dies?" Dave's voice cracked with anguish.

" 'And I give unto them eternal life; and they shall never perish, neither shall any man pluck them out of my hand.' John, ten, twenty-eight."

Dave swallowed and spoke carefully. "I mean, Jesus raised Lazarus from the dead, but these guys are just doctors. Are we going against God's will? I mean, like you said, thy will be done, and all that. It's like we're being tested. You know?"

The Reverend Jason nodded soberly. "As in the days of Jesus. 'Now we know that God heareth not sinners: but if any man be a worshipper

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of God, and doeth his will, him he heareth.' John nine, thirty-one."

"But you're not telling us what to do!" Kathy wailed.

The Reverend turned to her calmly. "I'm sorry. I'm merely a man of God, or at least I try to be. I cannot decide for you. I cannot believe for you. I can only pray for you."

Dave felt a deep disappointment at that, but he understood the truth of it.

"If your hospital has good connections, I can come and pray by Trippy's bedside the way I have come here. Or I can pray here. Or I can pray for him and your loved ones in my chapel. I promise you I will do that. But I can do no more."

Dave looked at Kathy, and saw that she agreed, however reluctantly.

"But let's not close on so unhappy a note. Instead, let's sing a hymn that'll uplift your heart. The Merciful Sisters of Melody are here with me—come over here, Sisters—let's all sing! 'Amazing Grace!' "

The three Sisters hurried into view, seeming pleased; the Reverend stood and spread his long arms. They all crowded into them, looked up at him adoringly, and swung expertly into song.

Kathy joined in; so did Reverend Jason, who looked at Dave. They used to joke that Dave's singing would scare the crows, but he mumbled along, trying to remember the words, and humming when he couldn't. When it was over, they thanked the Reverend and the Sisters, and switched off.

The living room again darkened.

"Well." Kathy was clearly disappointed, too, though she'd evidently been thrilled to sing along with Reverend Jason and the Merciful Sisters of Melody.

"Yeah, well, you have to learn not to expect too much," Dave muttered.

The next few days were as bad as the last week had been, a melange: nightmarish hours in the white-lit hospital room where a pale, drawn Trippy lay uncharacteristically flat on his back with tubes coming out of his nose, his arm, between his legs. Dave spent silent, sleepless hours alone by night. He saw Laura at the hospital, or Laura preoccupied, or worst of all Laura weeping on him and begging for reassurance.

Dave called in to the yard, and Hunter told him to go ahead, take another week; they'd put the kid, Mick, on his welder. Dave didn't even worry about the kid burning out his welding tips. How was the boy? Hunter asked. Just the same, Dave answered numbly. Just the same.

Kathy was a big help. She visited Dave and Laura every day and took to cooking for them, at least one meal a day. It was all Laura ate, Dave saw.

Two nights after the Reverend's visit, Dave sprawled back on the couch holding Laura in one arm, and aching: Trippy should have been in the other. He studied Laura's face with a deep tenderness. It was worn now with suffering but more beautiful than ever. When Laura Li had first been described to him as a Chinese American, he'd pictured some little doll of a woman with an expression-

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less face, like painted porcelain. Laura was five feet ten and statuesque in build, and had the most vivid and expressive face he'd ever seen.

"Davey? Has Kathy been talking to you? About seeing the Reverend Jason?"

"Yeah, we invited him day before yesterday. Video appearance. Didn't cost much." He had told her that before, but her memory for little things had been poor lately.

"Not that. She's talking about going to Atlanta and seeing him in person."

Dave sat still in surprise.

Laura twisted to look at him. "Davey?"

"Uh, kind of expensive, isn't it? I mean, we already asked him for his opinion."

"Kathy thinks you'll get a better answer in person, where he can't just switch off."

"We?"

"Yes, she can't go alone." Laura sat up a little, earnestly, turning under his arm. "Davey, we can afford it. We have good insurance."

Laura made half again as much as he did, and he was proud of her for it. He'd never understood why she cared for a blue-collar lunk like him. Her insurance was covering practically everything—and Hunter was letting him take his vacation, so he wasn't losing money, either. She was probably right; they could afford it. Still, the German peasant in him rebelled: with a really sick boy, who knew what expenses would come?

"Kathy can't afford it," he said quietly. "We'd have to pay her way, too."

"It's no expense. You can go by bus; it's real cheap these days, and so are motels."

Dave said nothing.

"I know how you've been troubled about this, Davey," Laura said quietly. "I don't know what to do, either. I only want the best for T-Trippy." She paused to steady her voice. "If the Reverend Jason can help us decide, then let's ask him. We can talk it over after you come back. Will you go with her? She shouldn't go alone; besides, he's our son."

"I hate to leave him."

"I know, but remember, he won't even know. I'll stay with him. Why don't you go? Even if the Reverend can't tell us what to do, surely he can help you decide. Pray on it tonight, OK?"

Dave hesitated. Laura had been leaning toward the experimental regeneration process that troubled him so. Her request now surprised him. The Reverend was most likely to counsel against the procedure, from what Dave had seen of the man; he was pretty conservative. With a sudden stinging in his eyes, he hugged Laura, realizing that she was willing to take the risk of hearing the Reverend's opinion, for his sake.

She smiled wanly at him, apparently divining his thought. "And maybe he'll urge you to go for it."

Dave put his face to hers. Asking the Reverend to take their burden suddenly felt very inviting. "I'll go along with whatever he says."

The big Trailways bus wasn't even nuclear powered. While city folk moved faster and more efficiently all

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the time, welders and mechanics and bartenders and their families out in the country still traveled by bus. This one smelled of kerosene and alcohol and its converter turned them into electricity rather inefficiently; the back end of the bus was noticeably warmer, despite the air conditioning. In his daze, Dave Kiefer hardly noticed. The scenery passed unseen as he relived the morning's stop at the hospital in Poplar Bluff, where nothing had changed in his son's condition.

The bus was approaching Cape Giradeau when he suddenly remembered Kathy's daughter Connie, five years old.

"Where's Connie?"

"She's staying with her father," said Kathy, clutching the little white Bible she had been given on her baptism as a baby. "It's only for a couple of days. Judy will be nice to her."

"Oh."

Dave remained in his numb state while they crossed the Mississippi, cut south through a corner of Illinois, crossed the Ohio, and rumbled down through a corner of Kentucky to Union City, Tennessee. It was dark before they reached that great sprawling city, a vast spiderweb of light.

Dave and Kathy dozed fitfully in their seats throughout the night, as the bus rumbled and stopped, started and rumbled on, through darkness and occasional lights and darkness again. They were grumbling into Chattanooga the next morning and had a lengthy stop for breakfast. Dave tried to wake up, but coffee in his stomach and water splashed on his face were not much help after the uncomfortable night: then they were back in the same positions, heading south toward Atlanta.

Kathy periodically opened her Bible and read silently. Other times, she closed it and simply held on as she gazed out the window. She said nothing about what she read to Dave.

As the bus rumbled on, Dave realized that he was in no hurry to reach Atlanta. Right now, he could wallow in worry with the pretense that he was actually trying to accomplish something, but that would end when they reached their destination. What if Reverend Wayne actually recommended the new regeneration process? Laura, who numbered scientists among her well-educated relatives, was desperate to try it. Dave still felt it was somehow against the will of God, despite his promise to abide by the Reverend's advice. He clung to the hope that God would bring Trippy around without advanced medical help.

Dave thought of Laura's tortured face. He did not like the idea of calling home to tell her the Reverend had prohibited the procedure. Maybe Kathy would make the call.

Of course, Dave realized Kathy was hoping the Reverend would explain that using the new process was also the will of God.

Whatever, Dave thought, with the fatalism of his peasant ancestors. If Reverend Wayne decided for it, he would accept the procedure; if the Reverend denounced the process, Dave was determined not to allow it

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for Trippy.

I just hope he gives us a real answer to our question, this time, he thought wearily.

They were weary unto exhaustion about midday, when the bus stopped at City Central Terminal in Atlanta. Dave and Kathy both stumbled on unaccustomed legs down the steps and went into the sprawling, noisy building.

"I need a rest room right away," Kathy said. "Then we should get some lunch so we don't meet the Rev'ren' on empty stomachs. Listen, let's dump our things in one of the lockers."

They stowed their luggage in a locker and ate lunch in the terminal's cheapest burger joint. Dave's hands were free now. Kathy kept only her purse and her Bible.

"We could check the motel registry and find a place for tonight," said Dave, as they finished lunch. "Or we could do that after we go out to the chapel."

"The First New Testament Gospel World Fellowship Church," Kathy corrected. "Davey, we have to go right out there or you'll just fidget all day and so will I. We can find a motel later. Now I got the address right here, but let's check the City Directory to be sure."

Dave glanced around uncertainly. He knew she was right about going to see Reverend Wayne right away. Dave was disoriented, partly because of Trippy and now partly after the long ride and uneven rest. Right now, he was glad to let Kathy take charge.

Kathy found kiosks with access to the electronic City Directory for passenger use. According to the information on the kiosks, City Central Terminal tied together not only the interurban and urban bus routes, but also the rail tunnel from the airport and the "ski-lift" cable cars that were beginning to displace city busses in the twenty-first century. Kathy flipped through the City Directory and confirmed the location of the First New Testament Gospel World Fellowship Church.

"We could take the Overhead and walk part way," said Kathy. "Or we could rent a car here and drive."

"Let's rent a car. It might not be a safe neighborhood." Dave was uneasy about big cities.

"All right. I see a sign for car rentals. Come on." She gave him a concerned glance and made sure he followed her.

Kathy drove. At that time of day, traffic was light. The little car had a full charge of electricity, and though it wasn't controlled by the city, it had a computerized map and directory. Kathy keyed in the address and followed the map's illuminated and spoken directions. Dave watched for the spires of the Fellowship Church.

"We must be getting close," Kathy said. "See it?"

"No, nothing but these square-topped office buildings," Dave said uneasily. "The church is bigger than they are, isn't it?"

"It sure looks huge on holo. Wait a minute, we're on the same block. Where is it?"

"I don't see it," Dave muttered.

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"The directions say this is it." Kathy pointed. "Davey, it's just another office building." Her voice betrayed puzzlement as she parked at the first space past the building.

"You put in the address right?"

"I must have. I entered the name of the church with it; the map kicks it out again if they aren't right."

Even so, she checked the computer's memory and showed Dave the slip she'd written it down on: they matched. Kathy looked at him; Dave looked back at her.

"Right," he said tightly, opening his door. "Come on."

They got out and looked around. It was neither a fancy, high-rent business district, nor an old, run-down neighborhood. The office buildings were moderate in size and age, of the windowy block style that hadn't changed much in a hundred years. Dave and Kathy walked right to the one supposedly housing the First New Testament Gospel World Fellowship Church.

In the lobby, they found a directory of the offices. It had no listing for the church itself. However, Dave spotted a line reading, "First New Testament Gospel World Fellowship, Nathan Routledge, Pres."

Dave looked at Kathy. "Who's he?"

"Um—I've seen his name in the credits of the show," Kathy said. "I think he's some kind of manager."

The room number puzzled Dave, till Kathy realized it was a flight down, at the back of the building. As they worked their way through the halls, they passed a dentist, an optometrist, a hair-care shop that specialized in gold-plating hair, a computerized custom shoe-crafting shop, and other services. Dave also saw specialty stores, such as one that dealt in antique handmade "pearl shell" buttons—Dave knew they were made of freshwater mussel shells. Their great-grandfather had worked as a button-cutter in Westphalia, many years before; maybe this place had some of old Morris's buttons. Most of the people they saw in the halls seemed to be customers of the hair-care shop.

"Maybe this is the business office of the church," Kathy said hopefully, looking again at the slip of paper as they walked.

"I still can't figure out where that big church is."

Dave led her down a flight of stairs and found the unpretentious door to the "Fellowship." Inside, they found a tiny reception room with an attractive, primly-dressed holographic receptionist behind her desk against the far wall, making the room seem twice as big as it was.

"How may I help you?" the holorec inquired politely.

"Um—we want to see Rev'ren' Jason Matthew Wayne," Kathy said hesitantly.

The holorec had not smiled. "I'm sorry, the Reverend is busy at the moment and can't be disturbed. Did you have an appointment?"

"Um, no. We came all the way from Missouri—"

"You can arrange a visit with the Reverend by a simple phone call. There will be a small fee, of course, unless it's a local call. I tell you what. Why don't you go back to your hotel

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and call the Fellowship number, and have him visit you there?"

"We already interviewed him by phone," Dave said stiffly. "We want to speak to him in person."

"I'm very sorry. You understand, the Reverend has so many followers that, as much as he would like to, he can't see all of them personally. But he will make time for you, I assure you. In any case, he will pray for you. May I have your names and your problem, so he can pray for you?"

"He already is," said Dave shortly. "We'll be going."

He tugged Kathy toward the door. She looked at him questioningly, but said nothing till they were out in the hall again. He pulled her a few steps away from the door and stopped.

"Don't you want him to pray for you?" She sounded puzzled.

"He already is," Dave repeated hotly. "Look, we're not going to get through that setup; she's a computer simulation, and you don't argue with computers." His voice dropped despondently. "Besides, what she said makes sense. The Reverend can't just drop everything and see everybody who shows up on his doorstep."

"Call him and ask for a personal appointment?"

"The only number we have will get the same computer—it'll still tell us, phone interviews only."

Kathy thought a moment. "Maybe we could stay over till Sunday and go see him at the Fellowship Church services."

"If we can find it." Dave looked at her, then glanced up and down the hall. "Still, maybe you have something—they have a lot of space here, a whole corner of the building. Maybe they have services here. You know, those shows are heavily recorded and cut and patched. There must be a studio involved."

"Davey, what are you saying? That the church is fake?"

"Not fake. But it could be a studio set. The services could be in a fairly small room, with only a few in the congregation."

"A small congregation." Kathy brightened. "We'd have a real good chance of speaking to him, if we could get in!"

"Yeah. But I didn't see any announcements anywhere of services. There wasn't anything on the building directory or in the lobby and there's nothing here."

"I didn't see one in the reception room, either." She frowned. "Maybe it's by invitation only. Like, for the Reverend Wayne's original supporters, or if he worked a miracle on you."

They looked around gloomily for a moment.

"Wait a minute," said Dave. At the end of the hall, he saw an exit sign over a door. "Let's have a look." He walked briskly down the hall, with Kathy at his side.

He pushed open the door and found a loading area, built into the lower level of a slope. A couple of trucks were backed up to the dock. No one was in sight.

"Maybe we can get in the back way." He led her outside.

On the dock, Dave found that the First New Testament Gospel World Fellowship Church had its own deliv-

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ery door. He wasn't sure exactly what he would find behind it, but he had worked in a factory most of his adult life and knew something about loading docks and security. Receptionists and executives made him uncomfortable, but here where the real work took place, he should find the kind of people he knew. With a deep breath, he yanked the door open and stepped inside. Kathy followed.

Inside, a uniformed guard sat in a walled booth behind a security window, regarding them with arms folded.

A live guard, Dave quickly realized; a hologram would not need a security booth. He was a handsome young fellow with a mustache, wearing a trig uniform in Confederate gray with butternut piping. The blue armpatch said ATLANTA CENTURY SECURITY, INC., and his ID badge showed a picture of him and his name, MARCUS GENTRY.

"What can I do fer you?" Marcus Gentry asked through a speaker. He looked bored.

Dave suspected he was glad to see them break his routine. "We have a private delivery for—" Dave paused; he almost mentioned the Reverend, but that had gone nowhere.

"President Nathan Routledge," Kathy said suddenly, pretending to read it off the slip of paper in her hand.

"He don't come and go by this door. You tried the front office?"

Dave's heart pounded. He wasn't used to lying his way around, but this was for Trippy. "We aren't like National Express, you know? It's just a delivery."

Marcus Gentry still hadn't moved. "I'll see he gets it. Where is it, anyhow?" He looked pointedly at Dave's empty hands.

"He's got to sign for it." Dave slapped his hip pocket suggestively.

"I'll sign for it."

"We got to witness Mr. Routledge signing it," Kathy said earnestly. "That's why they sent two of us."

Marcus Gentry frowned at her thoughtfully, then punched into his phone console with one hand and hooked a light phoneset over his head with the other. When he pushed another button, all sound coming through the speaker from his side of the booth stopped. He spoke into the phone briefly.

Dave knew he and Kathy had stumbled onto the right story. The guard's job was to keep out people with no business here, but he could not risk sending away people who might be expected by the president of these offices. Marcus Gentry was passing the problem up the line to someone else.

As Dave watched anxiously, the guard hung up and turned the sound back on again.

"Mr. Routledge is not available," said Marcus Gentry formally. "His secretary is not expecting you. What does this concern?"

"Miracles," said Kathy, who was picking up the game quickly. "You know, like when water flows upstream and injuries heal."

Dave nodded grimly.

This time, Marcus Gentry made a call without shutting off the speaker. "Mr. Shelton, this is Marcus Gentry at the loading dock. I have two people

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who came to see Mr. Routledge but he is unavailable. His secretary suggested I contact someone in the pertinent division, and that's yours.... May I send them back? Thank you." He pressed another button.

Next to the booth, the lock on a heavy steel door clicked open.

"Come on in," said Marcus Gentry. "Mr. Cary Shelton is waiting for you in 0124."

"Thanks." A little embarrassed that their lies had worked, Dave pulled open the door and held it for Kathy, who preceded him. Then they walked down a clean, carpeted hallway lined with office doors, most of them closed.

Dave still saw no sign of any church. When he passed open doors, he found small cubbyhole offices and rooms full of computer video equipment. Kathy located the office they wanted, where the door stood open. She waited for Dave to go in first.

In the office, an untidy young fellow blinked up at them from a bank of video monitors in one of the cubbyholes. He was a tousled carrot-head with a freckly face, wearing jeans and a white shirt, the sleeves rolled up. A half-eaten ham sandwich lay on a paper plate at his elbow with a coffee cup beside it. Stickynotes papered his desk and his board. It was all typical computer stuff, nothing religious in sight. Dave didn't even see a Bible.

"Siddown, folks. I'm Cary Shelton." He took a bite out of his sandwich. "You have something to leave for Routledge? I wasn't sure what ol' Marcus was talking about, but Nate doesn't know computer imaging from red clay."

"Not exactly," said Dave uncomfortably. "We're a little confused." He looked at Kathy. "I think we better tell him the whole story. I'm Dave Kiefer and this is my sister, Kathy."

Kathy spoke up suddenly, her explanation of Trippy's condition and their visit coming out in an emotional rush. She held her Bible tightly in her lap with both hands, her anxiety speaking for both of them. Then she finished with the mystery: Where was the Fellowship? The Church?

Cary sighed and put down his sandwich again, saying nothing.

Dave tensed, waiting to hear if he could help them.

"So you see, we really need to see the Rev'ren' Jason," Kathy prodded. "We need his help."

"Well." Cary Shelton sighed again. "Yeah, uh... there's a problem."

"Yeah?" Dave felt a flash of angry impatience. "Nobody is so busy he can't spare a minute. She told you, it's my son."

"Yeah." Cary looked sincerely pained. "Look, because of your son's condition, I'm going to let you in on something. I hope you won't spread this around, but—you've seen the movie, *The Wizard of Oz*?"

Dave and Kathy exchanged a look.

"Yeah?" Dave said suspiciously.

"Well, remember, 'Pay no attention to the man behind the curtain'? It's like that here. I'm one of the men behind the curtain."

"I don't get it," said Kathy.

"In short, there is no Reverend Jason Matthew Wayne."

"Oh, come on, we even talked to

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him on the phone," Dave said angrily. "We had that hologram visit you guys advertise. He came and talked to us. You don't have to give us this run-around. Tell me where to find him and we'll leave you alone."

"I understand he visited you." Cary nodded gently. "By computer simulations, like the holorecepetionist out front."

"But he doesn't just talk business; I mean, he answered us." Dave heard his own voice rise in a desperate whine.

"Did he give you any advice?" Cary Shelton rocked back in his chair and looked at them imperviously.

"Well, no, he couldn't do that, of course—"

"You bet he didn't. He's programmed not to; we could get sued if he did."

Dave felt a hollow, sinking feeling. Computers, holograms, imaging.... "You're serious," he said faintly.

"Yeah. Look, the Reverend was put together from three old-time twentieth century actors. We figured people would be less likely to recognize them—also, they're in public domain now. We got his physique from Charlton Heston when he was young. Look."

Cary turned to his board and punched numbers for several seconds. Then he turned to the corner and the holo projector there threw up the image of a muscular young man standing on a raft on water, wearing only a ragged loincloth and chains on his ankle. An older man lay on the raft.

Dave was no expert on male physique, but the standing guy was as well built as the Reverend, for sure. The similarity was clear. He glanced in shock at Kathy.

Kathy looked stricken.

"We got the hair and that big smile, and the voice, from Burt Lancaster when he was young." Cary hit a few more keys.

The image of a very handsome man, wearing only tight, striped pants, swung up to a yardarm on a rope, against a bright blue sky next to Heston. Then he turned and smiled at them. The full wavy head of brown hair and the big-toothed smile were much like those of the Reverend.

"It's not quite the same, though," Dave said.

"Well, we adapted that jaw from Henry Fonda."

Another man's image appeared next to the others, a stranger wearing a casual blue uniform of some sort, walking the deck of an old steel ship. His long, firm jaw certainly looked much like that of the Reverend. Before their eyes, Cary overlaid the three images; as they watched, the images smoothly melted together. The Reverend Jason Matthew Wayne smiled at them.

Kathy let out a long, nearly-silent breath. "Oh, my...."

"The Merciful Sisters of Melody are purely fictional also," said Cary. "So are all the congregation."

"Wait a minute!" Kathy cried. "What about the miracles? We see miracles every day—people healed, and all. Is that all fake, too?"

"We hope not. You know, of course, that the illustrations we run

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in the background are video simulations?"

"Yeah, they're like old paintings and Bible pictures," said Dave. His voice dropped almost to a whisper. "But . . . the miracles, too?"

"Well, the Reverend appears by phone and prays for anybody. We get lots of mail describing miraculous healing. We call those people up and get them to sign releases before we use their stories on the show. But all the names are real, even though we don't always use the pictures; our simulations look better than real people. Yeah, the videos are faked—that is, dramatized with computer imaging. But those people tell us that the miracles really happened."

Dave's head ached. He rubbed his eyes. Those miracles they had seen so often had not occurred right in front of them. "They might not have occurred at all," he said angrily.

"If they lied to us, they're guilty of fraud. We're covered by the releases, and we say up front that it's simulated."

"That's right, they do, in that strip running across the bottom," Kathy said, subdued.

Dave saw that she was practically in shock. Her face was pale and her mouth open. He thought she might cry.

"Then the Fellowship Church is all a fraud!" he said angrily.

The computer nerd looked at him. "We don't feel that way. In fact, we think the Reverend is less fraudulent than many evangelists. We take care never to say or do anything that violates the FCC codes, or the mail fraud statutes; we never pretend to foster orphans, for instance, and then pocket the money people send for them. All of us here are on salary, and every penny that comes in is accounted for."

"But you charge for interviews with the phony Reverend! You're selling religion!"

Cary Shelton met his gaze directly. "What minister, what priest, what rabbi, works for free? They all get paid. Besides, we provide a service. It's a religious service, but legally it's not much different from the dentist, the hair-dressers, and the optometrist in this building—and it's almost exactly the same as the astrologer across the street. Why shouldn't religion be marketed electronically just like astrology is?"

Dave opened his mouth, closed it. He looked at Kathy. She was still stunned.

"Wait a minute, these phony visits—" Dave sat up earnestly. "You say the Reverend's a computer simulation—I mean, I know they can do the pictures, but—he spoke to us! And answered our questions!"

"Yes, we have a real good program; worked most of it up right here," Cary said patiently. "The phone visits bring in a good bit of our revenue. He's really good; quotes the Bible lavishly, visits the sick and those in need of aid, prays for anybody, acts sympathetic, and behaves like a minister. He's developing a big repeat following; some talk to him every day."

"But how can a computer act so—so real? I mean, a holorec just talks business, it's only got a limited

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rep—rep—"

"Repertoire. Yes. The Reverend Program is about thirty times as complex as a holorec, but that's not as hard as it looks. I mean, there are still some psychologists around who use the old twentieth century Freudian psychoanalysis. Lots of them used Doctor Programs like this. They all work by association. You say certain key words or phrases, like 'medical problems,' 'losing faith in God' or 'unemployed,' and the computer searches for an apt response from the Bible or other inspirational works. The Reverend really does respond to your actual words, so it sounds to you just like a regular conversation."

Dave stared at him, letting this sink in.

Cary Shelton smiled faintly. "In fact, that's the way most people talk—responding to key words or phrases, and then often going off about themselves with no regard to what you meant."

"Wait a minute." Kathy came back to life. "The Rev'ren' said he'd pray for Davey! How can he, if he ain't real?"

"Well, we can't be prosecuted for that—we don't think. In fact, he really does pray for everybody he says he will. We compare it to burning candles in front of saints or crucifixes, in the Catholic and Orthodox churches. Look."

He tapped his keyboard again. Now they were looking into the sacristy of the First New Testament Gospel World Fellowship Church, where the Reverend Jason Matthew Wayne knelt before the altar beneath the stained glass windows. They heard his resonant baritone voice, as with deep humility and faith he prayed to God. They heard him mentioning the names of people he had promised to pray for—not gabbling them off hastily, but delivering them in full orotund solemnity.

The view pulled back, and they saw two First New Testament Gospel World Fellowship Churches, with two Reverend Jasons praying but saying different names. As the scene continued to pull back, now there were four, then eight, then ten Reverend Jasons, and the ten Reverends were about the size of fingers in ten Churches a meter high.

"We're currently running ten chapels for three to four hours a day. So we can expand by a factor of six, minimum, before we lay on the second program of ten chapels," said Cary. "If you call the Reverend and he promises to pray for you, you get a free mention, once a day, for a week. If you ask for prayer, and make a love offering, you can extend that, week by week. And you can ask more than once. Some people are being prayed for three or four times a day."

For a moment Dave and Kathy were silent, shocked, staring at the ten Reverends praying before ten altars.

"Does God listen to prayers from people who aren't real?" Kathy whispered, still watching the ten Reverends.

"I don't know," Cary admitted. "The Reverends speak aloud with a human voice. Beyond that, I don't presume to know."

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"So it's just a business with you?" Dave asked, hushed. "You don't feel this is dishonest? That you're misleading people? Who knows what kind of advice that computer is giving them!"

Cary Shelton stiffened. "I have as much right to feel proud of what I do as the average service professional does. As for dishonest, we constantly run disclaimers and explanations; as for advice, we don't give it. The computer will quote appropriate bits of Scripture, and we research those bits carefully, to key them to the proper words and phrases. I have a degree in comparative religions. I studied Greek, Hebrew, and Latin, and also evangelical texts; likely I know more about the origin of your beliefs than you do, Mr. Kiefer."

Dave tensed, not sure how to respond.

"And I'm not irreligious. I'm a good Methodist, myself. But, you see, there are two kinds of believers. Some require an established church with structure, like me. But I take it you're evangelical, possibly Baptist?"

"Our family church is pretty similar to our Baptist friends'," said Dave. "Not that we're too particular, so long as they preach the Bible."

"Our program is directed toward such people; few Methodists would stay tuned in if they happened across the show while channel surfing. It appeals to people who require a charismatic, more openly emotional religion. And our show has a definite advantage over most charismatic broadcasts."

"What's that?" Dave asked suspiciously.

"Our minister can't get caught with someone's wife or daughter, or a prostitute, or with his hand in the till; he has no past to hide. He'll only age, or modify his religion, if we learn that his followers want him to. And he won't die. The death of the founder can devastate charismatic churches."

Dave nodded uncertainly, not understanding all of this. "What happens to those churches when the founder dies?"

"The founders usually have a supporting structure in place. But that structure is naturally made of people who excel at organization, not charismatic leadership, so they institutionalize the church. It begins to convert to the other kind of church—becomes dogmatic, hierarchical, and less responsive to the emotions of the people it once attracted. Then it finds another congregation, or it dies. Joseph Smith, Mary Baker Eddy, Aimee Semple McPherson, L. Ron Hubbard—the list is long. Some make it, some don't."

Dave felt baffled; he'd been out-argued, but he wasn't convinced. It still felt dishonest to him. Maybe, he thought, because I feel cheated.

"So the Rev'ren' can't help us?" Kathy asked meekly. "All he can do is just quote Scripture at us, and do that prayer thing? He can't tell us what we should do about poor Trippy?"

Dave looked at their host in silence.

"No, as I say, giving advice could be bad for business." Cary Shelton spread his hands. "What if the advice was bad, and you sued? We're just on the brink

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of major success with the Reverend Wayne; we're in over two hundred markets now and we're even thinking about opening a local church, and maybe doing a location shoot."

"But the miracles," Kathy said hopelessly. "Then the Rev'ren' can't heal Trippy. Don't you feel *wrong* about fooling people like that?"

Cary Shelton looked unhappily at her. "We have to have them; our market demands it. People must have miracles. The Catholic Church used to stage them regularly, even after scientists had figured most of them out. Even after the Shroud of Turin was shown to have been a beautiful fake done in A.D. 200, people still believed it was the shroud of Christ. Some still do."

"No miracles here," Dave said cynically, getting up. "I suppose you want us to keep your secret."

"I told you without conditions because of your son. Others know, obviously, including everyone who works here. Rumors are already circulating. If we're asked by the press or public at large, we'll tell the whole truth. We're ready any time for exposure. It can't be kept a secret forever. In fact, we expect an upsurge in interest when the truth comes out, but we want a firm base of followers first."

"Won't they stop following you, when they know?" Kathy's fingertips were nearly white with pressure on her Bible.

"At first, maybe. Some for good. But we put on a good show, better than most, and give good value for the money. Most will come back. And remember, we're not just exploiting people. Every member of the company is a Christian. What we're doing is as good as putting Bibles in hotel rooms, and maybe more useful."

"Maybe," Dave muttered bitterly. "Maybe not."

They left the rear of the building and walked around the block back to their car in the bright sunshine. Neither of them spoke. Kathy shifted her Bible under one arm so she could wipe tears from her eyes.

When they reached the car, they stood next to it indecisively. Dave didn't know what he wanted to do. Kathy fumbled a tissue out of her purse.

As she moved, her Bible jumped to the sidewalk, falling open. When Dave bent down and picked it up, his eye fell on the passage right over his thumb, Matthew twenty-four, verse five; on impulse, he read it out loud. " 'For many shall come in my name, saying, I am Christ; and shall deceive many.' "

Kathy looked at him in surprise. "You mean it just happened to fall open to that?"

Dave ignored the wonder in her voice; he was in no mood to interpret religion at the moment. "We got suckered, all right. We came here to see an Unholy Ghost." He gently closed the Bible and handed it back to her.

"Davey? What are you going to do about Trippy?"

Dave looked at his sister, feeling a grim new independence.

"We'll decide what's best for Trippy. Laura and me. We'll decide." ■

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THE REFERENCE LIBRARY Tom Easton

Flying to Valhalla, Charles Pellegrino, Avon (1993 hb, AvoNova/Morrow, $22, 338 + xiv pp. [ISBN: 0-688-12506-9]), $4.99, (ISBN: 0-380-71881-2).
End of an Era, Robert J. Sawyer, Ace, $4.99, 240 pp. (ISBN: 0-441-00114-9).
The Unknown Soldier, Mickey Zucker Reichert, DAW, $4.99, 314 pp. (ISBN: 0-88677-600-7).
Spindoc, Steve Perry, Ace, $4.99, 262 pp. (ISBN: 0-441-00008-8).
The Woman Between the Worlds, F. Gwynplaine MacIntyre, Dell, $12.95, 311 pp. (ISBN: 0-440-50327-2).
Arthur Machen & Montgomery Evans: Letters of a Literary Friendship, 1923-1947, Sue Strong Hassler and Donald M. Hassler, eds., Kent State University Press, $26, 195 + x pp. (ISBN: 0-87338-489-X).
Alien Pregnant by Elvis, Esther M. Friesner and Martin H. Greenberg, eds., DAW, $4.99, 320 pp. (ISBN: 0-88677-610-4).
Invisible Machines, Andrew Joron and Robert Frazier, Jazz Police Books (P. O. Box 3235, La Grande, OR 97850), $9, 59 pp. (ISBN: 1-877655-10-4).
BOOKS ON DISK

Charles Pellegrino—let's quote the dust jacket—is "the world's first astro-paleontologist . . . worked with the deep sea robots that probed the wreckage of the *Titanic*. He is a codesigner of the *Valkyrie* anti-matter rocket, and predicted (along with Dr. Jesse Stoff) the discovery of oceans inside certain icy moons of the outer Solar System. His speculative piece in *Omni* magazine on the possible cloning of dinosaurs was the basis for . . . *Jurassic Park*." In other words, he's so far out on the cutting edge that enthralls this magazine's readers that perhaps it was no wonder that his New Zealand university chased him out of town with the words, "You think in strange ways, and we don't know how we are going to bang it out of you. Sooner or later you'll be writing science fiction, and then you'll really embarrass us all."

I hardly need to tell you about his SF novel, **Flying to Valhalla,** do I? Already you're muttering to yourself that you've just gotta see what he's up to. So—the hardback came out last year, and the paperback was scheduled for release last April. And I'll tell you about it anyway.

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In its barest outlines, the tale is fairly simple: Chris and Clarice Wayville are aboard the antimatter space ship *Valkyrie,* on their way at 92 percent of light speed to Alpha Centauri, where probes have found not only life but also artificial satellites. The natives prove to be marsupials with a very highly developed ability to learn new facts; infants that lack the ability are culled; the few survivors are the only members of the species who can actually think, or put the facts together. The Wayvilles get acquainted, acquire a bug that must keep them from ever returning to Earth, and explore. They find signs that the locals, the Alphans, once had a civilization as or more developed than Earth's. They even find that another world in the Centauri system bears life, though its intelligent species seems frighteningly hostile and competent.

The story gains its excitement from its complications. Early on, Pellegrino reveals that the ancestors of the Alphans, some 33 million years ago, were frightened by the potential of a primitive primate to become a competitor and threat eons later. They therefore arranged for periodic asteroid bombardments of Earth; the idea was to keep future Earthlings from ever appearing; the effect was to hasten our development.

How likely is such paranoia? Pellegrino assures us that the SETI crowd has debated the issue, under the heading of "Where is everybody?" As far as we can tell, life is inevitable. Given life, intelligence is surely just a matter of time. So there should be lots of civilizations among the stars. And if even one of those civilizations ever began to explore the Galaxy, we would already have met them. Since we haven't, we have to conclude that there is something wrong with our reasoning, or that it is very likely that at least one intelligent species decided it could not tolerate the possibility that another would attack it with unstoppable relativisitic bombs. So it struck first. If SETI ever hears a radio voice from the stars, it will come from a species that is young and stupid, that has just been attacked and is issuing a last, despairing death cry, or that is tempting future victims to reveal their presence.

Chris Wayville is well aware of all this. It haunts his dreams, and when relativisitic travel apparently opens him to visions that feel a lot like prophecy, he begins to feel and act a bit crazy. He also gets his wife very concerned and worries the dickens out of Mission Control. When Earth breaks contact, he decides that it fears he or the rapidly learning Alphans will eventually mount an attack. The question of how to forestall Earth's preemptive strike becomes of vital concern.

Chris finds an answer, but it is necessarily a temporary sort of thing. And there are loose ends—the other aliens—to be coped with, presumably in a sequel. Eventually, Pellegrino reveals in a "Chronology" at the front of the book, Earth will be evacuated.

All the mystic hooraw about Chris Wayville's visions and death-rebirth experience left me pretty cold, but that's all right. We'll have future as-

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tronauts, just as we have had past astronauts, who believe in such things, and I can believe in such people even if I don't share their beliefs. For me, the mysticism did not spoil the story because Pellegrino put so much else into the package to keep me turning the pages.

Great stuff. Highly recommended. Now go buy it.

There have been so many dinosaur stories lately that one might expect the spate to be diminishing by now. But dinosaurs have always been popular, in SF and out of it, and even without the movie *Jurassic Park,* they would still account for more than their share of bookshelf space.

Face it: It would take as big an impact to wipe dinosaurs out of SF as it did to wipe them off the planet. Or . . . was it *really* a comet or asteroid impact that did the job? That's the way it looks from 65 million years later, but there are other possibilities, if none quite so strange as Robert J. Sawyer suggests in *End of an Era.*

The gimmick is time travel. Brandon Thackeray and Klicks Jordan are two Canadian paleontologists assigned to ride the timeship invented by Ching-Mei Huang back to a day not long before whatever did the dinos in did its dirty deed. The two men are friends but also rivals over one very fundamental matter: Klicks has taken up with Brandy's ex-wife, Tess.

What do they find back when? It isn't simple. The dinos are there, but the gravity is much less than we are used to (which explains how Brachiosaurus could be so big). There are two moons in the sky. Mars is green. And one of the first dinosaurs they meet turns out to be inhabited by a sky-blue slimeball that insists on crawling inside Brandy's head to absorb his memories, including a knowledge of English. A second slimeball does the same to Klicks.

Shades of Heinlein's puppet masters! What are the slimeballs? Where are they from? What are they doing on Earth? What do they have to do with the K-T extinction of the dinosaurs? I really can't tell you, for figuring those things out is precisely what occupies Brandy and Klicks throughout this short novel. Suffice it to say that the past ain't what you or anyone else (except perhaps tabloid reporters; see below) ever dreamed it was.

But there's more. To the reader's confusion, Sawyer introduces a second Brandy, who still has his wife. He's not a time traveler, but when the first Brandy's diary somehow shows up on his laptop computer's hard drive, he looks up physicist Ching-Mei Huang, who is in this world a frightened, traumatized recluse. She is not about to invent a time machine. On the other hand, she can offer insights into what is really going on, who created life on Earth, and who is really the puppet master around here anyway.

I didn't believe it for a minute. Sawyer finds rabbits in his hat far too easily. But I still enjoyed it, and I think you will too.

Mickey Zucker Reichert's **The Unknown Soldier** is an excellent thriller that begins when a battered amne-

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siac arrives in the emergency room of Liberty (Iowa) Hospital. He is the first major case for intern Jason Walker, who is encouraged by resident physician Shawna Nicholson. Together they find that their mysterious John Doe does speak English, even though he does not seem to recognize quite ordinary things, such as corn fields.

John Doe himself thinks his name might be Carrigan, for that is what a lover calls him in a memory. He also seems to be a skilled murderer, though he cannot be sure whether he was cop or soldier, secret agent or criminal hit man. He discovers he is claustrophobic, dislikes Walker, and trusts Nicholson. He gets her to be his primary caretaker, while she resists the thought that she may be falling for him.

And then he awakens to find a swarthy figure attempting to kill him. Mayhem erupts in the hospital corridors. Carrigan, Walker, and Nicholson flee to presumed safety and find the villains hot on their tail. The chase is on, relentless, fast moving, and accompanied by both a growing body-count and a spate of remembered revelations about the future time from which both Carrigan and his ruthless foes came. The climax comes on a California military base, with both hero and villains surrounded by helicopter gunships.

The evil plot that motivated Carrigan's initial plunge into the past is an unlikely throwback to the days of mustache-twirling villains, but Reichert's pacing and plotting are near perfect. This one's a real adrenaline-pumper of an extended car chase, and it would surely make a successful movie.

Another fast-paced, extended chase is Steve Perry's **Spindoc.** The time is far enough in the future for Earth to have colony worlds that have pretty well grown up. There is rapid FTL travel. There is quarantine to keep colonial visitors from inadvertently spreading another virus like the one that forced Earth's natives to become vegetarians.

Some things, of course, remain the same. Bad PR happens, as when a "dropbox" bringing tourists from orbit to ground crashes, and then the company puts its flacks on the job to minimize the damage to corporate image. One of these "spin doctors," the spindoc of the title, is Venture Silk. Perry shows him at work in his Hawaiian home, lying furiously for pay, relaxing at the crossbow range, chatting with his lover, Mac—a medic at the local quarantine center who has noticed something a bit strange in the blood of a colonial tourist.

Then Mac is dead, supposedly killed when a tourist broke out of quarantine. We, however, know that the real murderer is Depard, a rogue secret agent after a secret he is sure will make him rich beyond all his dreams, and when Depard closes in on Silk, we move onto the edge of our seats, cheer when Silk fights him off with his crossbow, and boo as the villain twirls his mustache and sneers, "Coises! I'll get that whippersnapper!" We cheer again when Zia, the

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colonial secret agent, appears to seduce Silk, the two fall for each other, and the chase is on.

What's the maguffin? What else but something mysterious in colonial blood, a treatment that Zia dreams of getting when she succeeds in her mission, a grail fit to motivate all the hot pursuit anyone could wish. You could be pardoned for thinking fairly early on that it must be something like an immortality serum.

Perry has a tendency to be predictable, and *Spindoc* isn't "about" anything but itself. But he also has a gift for background—his future world feels very real, even though he strikes me as going just a little overboard in giving every little thing in today's science news a recognizable consequence—and action. *Spindoc* is a fun read.

F. Gwynplaine MacIntyre's first novel, **The Woman Between the Worlds,** amply fulfills the promise of his short work. His is a playful mind that can play Mixmaster with an astonishing variety of elements and still produce a successful cocktail.

The Woman Between the Worlds has something of a familiar feel, for science fiction and fantasy set in Victorian England today form a virtual subgenre of the field. Yet watch what MacIntyre does: His narrator is an impoverished tattoo artist into whose shop steps an invisible woman. Vanessa is of course quite naked, and when he—remembering Welles's *Invisible Man*'s visible retinas—questions her, she explains that she comes from a parallel dimension whose colors lie beyond the ultraviolet end of the spectrum. What does she want? Why, just that he tattoo her all over, flesh color, please, and turn her into a normal woman.

It is not long before Our Hero discovers the real and awful truth: Vanessa is an alien being who only seems human. She has fled the Dreadful Eye, a tyrant of quite ineffable evil—Satan is a piker—and she wants to return to lead the rebellion. Yet the Eye's servants, as invisible as she, are prowling London, hunting for her and eager to destroy all who stand in their way. They can be slain by bullets and knives, and alcohol withers them, but there are thousands of the monsters, and here they come! Through the windows! Through the doors! Chasing through Paddington Station and down the railroad tracks!

MacIntyre's novel is chockablock with Victorian celebrities, from costar Aleister Crowley to Sir William Crookes and William Butler Yeats. There is color galore, cosmic threats, suspense, chase scenes, derring-do, and ultimate sacrifice. It's even SF, for though Vanessa's folk are shape-changing predators and the Dreadful Eye is an immaterial fellow who can inhabit any dead matter and bend its shape to his will, he claims to be as old as the Universe, a feeder on pain who moves among the dimensions with the aid of strange devices.

A fun book that will please any reader with a taste for the Victorian milieu. The only flaw is that MacIntyre occasionally lets his taste for satiric, ironic, sardonic asides get out of hand.

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* * *

Arthur Machen (1863-1947), who makes a brief appearance in MacIntyre's novel, was a writer of horror and occult fantasy (mostly) who had a career as "writer, translator, and actor . . . [and] did a great deal of hackwork. By the time he was rediscovered in the 1920s he was near retirement, and no longer capable of producing high-calibre material" (according to his entry in the Clute-Nichols *Encyclopedia of Science Fiction*). Yet according to Sue Strong Hassler and Donald M. Hassler, editors of **Arthur Machen & Montgomery Evans: Letters of a Literary Friendship, 1923-1947,** he was a seminal figure with traceable influences on such later luminaries as H. P. Lovecraft and Ray Bradbury. Certainly he inspired in the 1920s the adulation of a number of figures such as collector and would-be writer Montgomery Evans, and the letters the two exchanged—and which Evans preserved with nearly idolatrous care—commented on an interesting portion of twentieth century literary and political history.

The Hasslers have tried very hard to annotate those letters into usefulness, and perhaps they succeed if the reader is already a confirmed Machen fan or a literary historian. They did not succeed in convincing me that Machen was anything more than a querulous, self-absorbed hack, or that Evans was more than a sycophant who yearned for a bit of the glory he perceived in Machen to rub off on him.

The book would be much better justified if it spent a few pages establishing and discussing Machen's influences on later writers. As it stands, it is enough to make me mourn the trees that died for its sake.

Over a decade ago, one of *The National Enquirer*'s editors called Stan Schmidt to ask if he knew a biologist with imagination. Stan gave him my name, and every year since then I have fielded several calls from tabloid reporters wanting to know something about the future of genetic engineering, or how to tell if your coworker or neighbor is a space alien, or. . . . You get the idea. It's been fun, it's been a chance to play another version of the SF "What if . . . ?" game, and once or twice I've even been able to kill a story (such as the one about the Russian hunter who bagged a sixty-pound butterfly with a six-foot wingspread).

It also meant that when Esther Friesner's and Martin H. Greenberg's **Alien Pregnant by Elvis,** an anthology of three dozen take-offs, spoofs, and send-ups of the tabloid outlook, landed in my mailbox, I was delighted. It looked like a hoot.

As it turned out, it was, though trying to swallow it whole at one sitting was surely a mistake. Not surprisingly, given the book's title, there's rather a lot of Elvis sightings, not to mention JFK, Marilyn, Hitler, and UFOs. Much better were those stories that exploited the tabloid tendency to spin a sensational headline over a fairly prosaic kernel of truth, such as t. Winter-Damon's "Magnetic Personality Triggers Nail-Biter's Near-Death

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Ordeal!" and Alan Dean Foster's "NASA Sends Addicts to Mars." The best of all was surely Allen Steele's "2,437 UFOs over New Hampshire," concerning a town taken over by paranoid UFO abductees. Also good were eluki bes shahar's "Is Your Coworker a Space Alien?" and Dennis McKiernan's "The Source of It All," as well as Mike Resnick's take on the difference between normal and bizarre, "Stop Press" (and he should know; he's the only contributor who admits to experience as a tabloid writer and editor).

With 36 stories in the book, there's no way I'm going to mention or rate them all. But if you wish to see what your favorite author can do with the tabloid idea, here are a few additional familiar names: Barry Malzberg, Kristine Kathryn Rusch, John DeChancie, Thomas F. Monteleone, Bruce Boston, Dean Wesley Smith, Esther herself, Harry Turtledove, David Brin, and George Alec Effinger.

Have fun, and do note, as you read, how astoundingly '50s many of the stories feel, which surely says something profound about the secret true identity of Sensawunda the Talking Dog (Two Heads! Three PhDs! Details on page 7!).

In his preface to his and Robert Frazier's book of collaborative poetry, **Invisible Machines,** Andrew Joron says that, "Collaboration heightens the game-playing aspect of writing. . . . Of course, language is valued differently in SF: there, the tradition of collaboration is pervasive because ideas are not considered as private property. SF stories often arise as a result of brainstorming sessions with other writers. SF is, in fact, a *dialogical* genre, one in which texts are written in direct response to other texts, in which meanings are produced and sustained by community effort."

It's an interesting way to look at SF, but I can't help but think that non-SF writers also write in response to other texts. They may not do so as explicitly, and they may not borrow each other's inventions (orbital elevators, ringworlds, cyberpunk, punk elves, time travel, etc.), but people don't think and create in vacuums. The responses have to be there, visible when the writers point to their inspirations, as when Frazier says, "Inspired by Kafka's *Metamorphosis,* we explored the future city and information revolutions before cyberpunk blossomed into a science fiction idiom." He is also just a mite more possessive than Joron about his and Joron's creations.

Those creations have appeared in a variety of magazines, chapbooks, and books of poetry. Some show a grand command of metamorphic imagery ("A Measure of Calm"), reflect future from past intriguingly ("Europe After the Rain"), or reflect on the discovery of a Chinese emperor's terra cotta army ("Excavations").

The authors are award-winning poets, but no one should buy this book expecting clever rhymes and jolly, bouncing rhythms. The dominant tone is far more serious than that. Indeed, the tone is often so seriously arch, aloof, and cool that many readers may have trouble finding the em-

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pathy necessary to read the poems.

BOOKS ON DISK

The other day, David Leithauser (Leithauser Research, 4649 Van Kleeck Drive, New Smyrna Beach, FL 32169) wrote to say I had plugged DART, Orpheus, and a few other display engines for digital publishing, and here was his, called HyperRead.

The part of HyperRead one uses to generate a HyperRead document is shareware (get it, try it, like it, pay for it and get rewarded for your $25 check with a few useful extras). The part you use to read a HyperRead document is freeware (meaning you can give it away with whatever HyperRead documents you prepare). And it's not a bad little package. As Leithauser notes, "All such programs balance trade-offs between program size, cost, features, versatility, etc." This one is very compact and quite spry, though it is reportedly slow to load large documents. It can display pictures and run external programs. And setting up a HyperRead document seems to be a very straightforward, simple process. On the other hand, it gains these advantages at the cost of making a HyperRead document difficult for even its creator to modify without starting all over.

When you prepare a document for a program like DART, you embed all the markers that identify italics, boldface, and hypertextual cross-references in the document itself. HyperRead puts these markers in a separate file, keying them to the document by position so that later adding or dropping a line throws off all subsequent markers.

From the reader's point of view, this is no problem at all. The digital publisher may find it awkward, but even so it may prove not to be too great a price to pay for the program's advantages.

You can get a copy of HyperRead if you buy the fourteenth issue of *The Electronic Publishing Forum* (available for $6 from Serendipity Systems, P. O. Box 140, San Simeon, CA 93452; $12 for a four-issue subscription). EPF-14 also carries news of the digital publishing field (J. Neil Schulman's SoftServ is dead, for instance) and announces the winners of the second annual "Digital Quill" awards for excellence in digital publishing.

Del Freeman took the prizes for both best electronic magazine (*Ruby's Pearls*) and best short story ("Kent's Place"). Best original fiction book went to Larry Blasko's *Vamp!* Bob Patterson took the nonfiction book palm for his *Civil War Computer Archive*. Ted Husted's DART won for publishing software, with Rod Willmot's Orpheus and Leithauser's HyperRead tying for third (second place went to Michael Gibbs's ReadRoom, which I haven't seen). ■

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BRASS TACKS

Dear Editor;

As a dabbler in palaeoxen-oörnithology myself, I think I recognize the bird (zhburtz'-ming) which Brax saw playing a Gawainian stick and ball game ("From the Travel Diary and Sketchbook of Braxton Montague Shew III," Mid-December '93). Although the accompanying sketch wasn't in color, I'd bet unicreds to glucose burgers that the main coloration is blue. If so, I think it is an evolved form of a bird first cataloged by the 1990s' Vogelmeister, C. D'eau-Gastogne: Cyanocitta christata torontiensis. I understand that a common Gawainian war cry still goes something like "Ouéd'go d'zhaaaz!"

MARC A. SCHINDLER

Gloucester, Ontario

Dear Dr. Schmidt:

I really enjoyed Michael J. Flynn's "Melodies of the Heart" in the January 1994 issue. I thought it was a very well written, up-to-date reworking of the Old Timer theme. The historical stuff seemed to be carefully researched, but I'm a little skeptical about one point. How could Mrs. Holloway have voted for Zachary Taylor? I would have thought that the first presidential election in which any women voted would have been the one in 1892, after Wyoming was admitted to the Union.

FRED GALVIN

3004 Oxford Road
Lawrence, KS 66049

Dear Dr. Schmidt:

After reading Michael F. Flynn's "Melodies of the Heart," I felt compelled to write to say that it is one of the most profoundly moving pieces of fiction that I have read in a long time. And one of the finest stories, in my opinion, that I've seen in over 40 years of reading *Astounding/Analog*.

And I really don't know why. It seems somehow to breathe reality; the people are believably human. That there is neither a happy ending nor a tragic ending is perhaps a touch of reality. The story is a sequence of lifelike events that culminate in a natural and believable conclusion.

The story is so far removed from the *gee-whiz* school of science fiction that I wonder whether it represents a new phase in the evolution of the genre. If so, I heartily approve.

ORESTES N. STAVROUDIS

Mexico

Dear Stan:

I hope your editorial (January '94)

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causes people to think instead of simply getting them riled up. For years, many in the science fiction community have refused to recognize that NASA is not the road to space but the roadblock. Since 1957 we've been trying to foster space travel as Arthur Clarke described it in the 1950s; now it's time to try it as Robert Heinlein described it in the 1940s.

For private entrepreneurs to make space pay, however, the cost of getting into space must be reduced. Your readers may be interested in a report I have recently completed: "Meeting Space Launch Needs Economically." It's available for $15 as Study # 173, from Reason Foundation, 3415 S. Sepulveda Blvd., Suite 400, Los Angeles, CA 90034.

JOSEPH P. MARTINO

Sidney, OH

Dear Stanley,

In answer to your excellent January editorial, "Job Opening," I have been mulling over an idea for about a year, now, and since you have brought the subject up, here are my thoughts:

I think the bottleneck in Space Exploration might well be eliminated by instituting a national lottery for rides on the Space Shuttle. If even a very few ordinary citizens become eligible for a ride in space, say one or two a year, I feel pretty sure the common attitude toward the space program would change back to one of excitement and anticipation. Think how many ordinary citizens of every kind and income bracket buy magazines from one of the sweepstakes houses knowing how small their chances of winning even a small prize. Hope is a powerful incentive; the fact that a given person's odds of going into space have moved from zero to even a very small positive value might well really change his or her attitude toward the whole question. By selling the tickets for a nominal sum, funds might be raised to offset the expense of the program.

Of course, there would have to be a physical exam, a very comprehensive insurance program to cover possible accidents, and a training program. This would also afford an opportunity to talk about the natural risks of any kind of original exploration. The fact that some early pilots were killed flying only made the endeavor more daring and glamorous. The chill that resulted from the loss of the shuttle might have been avoided by some plain talk about risk and courage before the fact.

If the winner was also allowed to sell the ticket for cash or put it up for bids at a National Public Auction, the cash value of a chance to go to space might end up being "astronomical," and since this culture of ours values money more than almost anything, the value of the Space Program itself might also climb back to where it belongs. It sure would put us in the news and the public eye, and I think it might help raise the excitement level enough to make the difference.

ROCKY FRISCO

Tulsa, OK

Dear Mr. Schmidt:

Now I am perplexed. Ian Stewart's

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"The Real Physics of Time Travel," January '94, was (is) a delight. Although not a mathematical person, I prefer digits of constants with which I may deal to remain the same from year to year.

I suspect Mr. (Dr.?) Stewart patronized his audience in the United States by referring to the speed of light in miles per hour with 186,000 miles-per-second parenthesized. (Ian, we can handle meters and kilometers when necessary.)

His mention of c (light-speed) as 670,647,740 mph set off an alarm in the back of my mind. Several years ago I had converted c to mph using the constant developed around 1987 and it was not the same. His number surpassed mine by 8.64289 mps—not much by terrestrial standards, but when measuring astronomical distances this is a zebra of another stripe!

As to my perplexity; has the 1987 valuation of c as 186,282.3959 mps (299,792.458 kps) been upgraded to 186,291.03888?

I've long held mixed feelings about the inviolability of c, even in the face of the late Isaac Asimov's continued contention that c could not be exceeded (though he did in a story or two), and who am I to contradict the Good Doctor, himself?

Ian Stewart gives us hope that our Universe lies somewhere between Schwarzchild's and Minkowski's, and with a little Einsteinian twist and an Alan Guth goose, we may yet cross the known Universe in an hour and a half (subjectively), or zip into the past or extrapolated future in less.

Thank you, Ian Stewart, for an energizing article.

Analog, keep 'em coming.

WILLIAM APPEL

Hilmar, CA

The author replies. . . .

Dear Mr. Appel,

Good question. Let me try to reconstruct my train of thought. No, I wasn't being patronizing—at least, that wasn't the *intention.* It was one of those weird decisions that authors find themselves taking on entirely spurious grounds. I wanted to start with Newtonian relativity and talk about a car. I've lived in the States, and I'm aware that, while it goes without saying that every *Analog* reader will be entirely happy with the use of kilometres, all Americans *and all Brits* know that cars travel in mph. (In the UK all measurements are now metric, officially, *except* the pint of beer, the pint of milk, and the mile on road signs and car dashboards. Though the building trade measures everything in millimetres—to avoid decimal points—and the timber trade uses the "metric foot" which is 30 cm. So much for standardization. But I digress.)

Having settled on mph for the car, I was perforce required by consistency to use mph for the speed of light. Unorthodox, I grant, but I did this in the original talk on which the article was based, to the Novacon SF convention in Birmingham, and it seemed to amuse the audience; so I left it that way.

My calculation was based on a table of fundamental constants that I own

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(*Science Data Book*, edited by R.M. Tennent, Oliver & Boyd), which puts c at 2.997924590(8) × 10^8 ms^{-1}. I haven't rechecked whether this leads to my mph figure (am however relieved that our two values are so *close*, because, being a professional mathematician, I usually screw up my arithmetic) but it's what I started from. It is indeed slightly larger than the figure you state. What I cannot vouch for is the accuracy of my source, which I *now* notice was first published in 1971 and has been reprinted unchanged ever since.

I thank you for alerting me to this discrepancy: henceforth I will consult my *Encyclopaedia Britannica*.

IAN STEWART

Dear *Analog*:

Re Erin Leonard's story "The Lab Assistant" in the Jan. *Analog*. I think Dr. Gross' Detector is way too broad in its effects; if it treats baldness or lefthandedness or excessive skin pigmentation as defects to be terminated, and adding it to the water supply would be too excessive a use. However, if you postulate a more limited version, only applying to conditions like muscular dystrophy and Lou Gehrig's disease, and only used by women who voluntarily choose to use it, it would not seem to be a problem.

Consider a test which would tell a woman "If you get pregnant now, you will have a child with Lou Gehrig's disease, but if you wait three months and then get pregnant, you will have a healthy child." It would seem reasonable that many women would take such a test, and would choose to wait the three months if it was positive. I'd consider it unfair to ban such a test or to force women to immediately get pregnant if the test was positive.

The limited version of the Detector I postulated does not seem to me to be fundamentally different from such a test. Either would have resulted in Lou Gehrig and Steven Hawking never being born (but of course some other child would have been born three months later, who wasn't born in our world). I can't see making a distinction that Steven Hawking's never having been conceived because of his disease would be fine, but his having been killed as a three-week embryo because of it would be awful.

Of course, it's possible that having a condition like Lou Gehrig's disease might be an incentive driving some people to accomplish things, so that the children born three months later instead won't contribute as much to the world. But that's also an argument against the DNA correction method the story suggests as an alternative; you lose the incentive that way also, and thus lose the contribution to the world.

Anyway, it seems to me a basic principle that people should be able to make decisions for themselves about whether or not to have children, and that would include deciding whether or not to have a child with a major abnormality. The narrator certainly should be free to choose not to use the Detector in terms of her own child-bearing, but her sabotaging the project means making that

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choice for everyone else. The broadness of the Detector's effects and the concept of adding it to the water supply would make it apply to many pregnancies where the women involved would not want it to apply, taking the choice away from them; that's where I'd say the problem is, and that's what should specifically be corrected, not sabotaging the whole project and taking the choice away from everyone who *would* want to use it.

THEODORE JAY MILLER
Howard Beach, NY

Dear Stanley Schmidt,

I have just finished reading the January *Analog*. I learned from Michael Flynn in "Melodies of the Heart" that "all women are interesting" and that flappers displayed their womanly independence by drinking the illegal hootch that the earlier generation of women suffragettes had worked so hard to make illegal. The suffragettes of course knew that it was the demon alcohol that turned men into the evil cruel wife beaters. The flappers had apparently reconcluded that it was the evil men who conspired through the means of an insipid male dominated moral code to subjugate women by controlling their drinking.

In Charles Harness' "The Tetrahedron," the real reason Mona Lisa was smiling was that she finally able to slam the door of her time vehicle into the face of her 20th century American male chauvinistic tormentors and find a new life snug and warm in the cozy and no doubt liberated 15th-century Italy.

"Virtual Proof" by Doug Larsen was the hard bitten woman cop explaining to the inexperienced rookie male cop that he really must, instantaneously, draw his 10mm and blow away a wife beater whenever and wherever he should encounter the same. Happily at the moment of truth he does not freeze and does indeed not only blast away the evil pornography-watching psycho-killer, but he inadvertently bags a date-rapist on the side.

"Excerpts . . . Unkin" by Sarah Zettel & Laura Woody has a female equatorial alien being victimized by a male and no doubt northern hemisphere male chauvinist alien in the course of academic research. The plot proves the talented female's superior intelligence and self-control can defeat the bullying tactics of the male.

"The Lab Assistant" by Erin Leonard is remarkably similar in that a female equatorial human is being victimized by her northern hemisphere male human in the course of academic research but by superior intelligence and self-control. . . . Wait, I shouldn't forget the part about the wheelchair; the heroine is an equatorial female human with superior intelligence, self-control and who is differently-abled and triumphs by sabotaging an otherwise successful attempt to eliminate a host of genetic disorders. I'm really glad the good guys won that one.

Stan (I can call you Stan, can't I?), I have but one question. Did you actually save all of this propagandistic drivel for one issue and make it a theme for January 1994? If so, I sup-

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pose it's fairly clever and some of the stuff was pretty well done, eg. "Excerpts..." was fun and "Virtual Proof" had an interesting idea: shopping by virtual reality and the potential for fraud. Overall though, this feminist noise pollution is hackneyed and distracting from a good idea or story. Reading stuff from a feminist writer is like being stuck at a dinner seated next to an evangelical—well next to an evangelical anything. After the first two minutes you already know what the next two hours are going to be like and it doesn't look like it's going to be much fun. If this is not a one time fling with a theme and the "moonies are in the airport for good," then cancel my subscription and be so good as to send me my pro rata cost back to me.

MARK FEJTA

I'm sorry you saw the January issue as "feminist propagandist drivel," but I'm also astonished. I didn't—and don't—see feminism as a major issue in any of these stories, much less a deliberate theme for the issue as a whole. Frankly, it seems to me that something has made you awfully sensitive to "FPD" and you're looking so hard for it that you find it even where it isn't.

So—I can certainly promise you that I'm not going to make Analog *an organ for that or any other propaganda, but I can't guarantee that you won't think you see any (though of course I hope you won't). I will continue to be open, as I always have been, to stories that treat women as full-fledged people and recognize that they have sometimes had problems resulting from people not doing so—which, as near as I can determine, is all any of the January stories did.*

Analog:

I couldn't believe it! John Cramer, writing about tides (January 1994), refers to Mercury as tide-locked to the Sun, always keeping its same face to the Sun as it orbits. Where has Cramer been for the past 29 years? Doesn't he know that in 1965 it was discovered that Mercury rotates three times for every two circuits around the Sun? Does he still think Mercury has a twilight zone?

MARTIN GARDNER

Oops! Sorry 'bout that.... ■

EDITOR'S NOTE: If you would like your address to appear with your Brass Tacks letter, then please type the address at the *bottom* of the letter, after your signature.

People who live in glass houses shouldn't.

George O. Smith

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UPCOMING EVENTS Anthony Lewis

7-9 October 1994
ARMADILLOCON 16 (Central Texas SF conference) at Red Lion, Austin, Tex. Guest of Honor—Elizabeth Moon; Artist Guest of Honor—David Cherry; Editor Guest of Honor—Gordon Van Gelder; Special Guest—Guy Gavriel Kay. Registration—$25 until 26 September 1994. Info: FACT, Box 9612, Austin TX 78766. (512) 339-0673 (until 10 pm CT).

14-16 October 1994
NECRONOMICON 13 (Florida fantasy & horror oriented conference) at Airport Holiday Inn, Tampa, Fla. Guests of Honor—George R. R. Martin and Timothy Zahn. Registration—$13 until 15 September 1994, $25 thereafter. $10/day at the door. Info: Necronomicon 13, Box 2076, Riverview FL 33569 (813) 677-6347.

28-30 October 1994
WORLD FANTASY CONVENTION at Clarion Hotel, New Orleans, La. Guests: William Kotzwinkle, George Alec Effinger, George R.R. Martin, Tim Powers. Registration—$30 supporting. Limited to 1000 members. Info: World Fantasy Convention 1994, Box 791302, New Orleans LA 70179-1302. (504) 769-3766.

24-28 August 1995
INTERSECTION (52nd World Science Fiction Convention) at Scottish Exhibition & Conference Centre, Glasgow, Scotland. Guests of Honour—Samuel R. Delany & Gerry Anderson; Fan Guest of Honour—Vin¢ Clarke; TMs—Peter Morwood & Diane Duane. Registration—£60/US$95/CDN$120/DM160/DFl 180 until 30 September 1994. Supporting—£15/US$25/CDN$30/DM40/DFl 45. At-door rates not set as of the time of this listing but will be greater than current attending rates. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Intersection, AdMail 336, Glasgow G2 1BR, UK; Intersection, Box 15430. Washington DC 20003-4030, USA.

You can send me e-mail about your convention—A.LEWIS20 on the GEnie™ network. When calling conventions for information—do not call collect and do not call too late in the evening. ■

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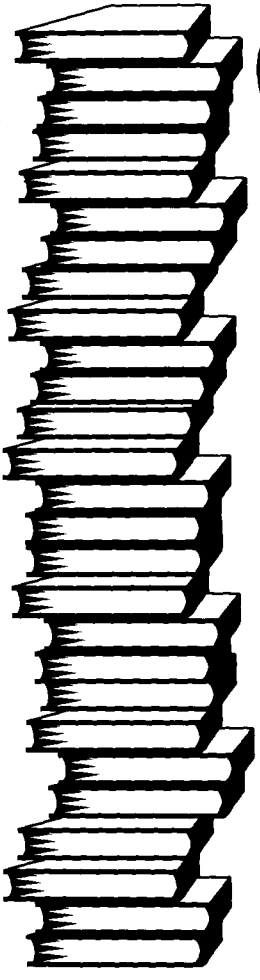

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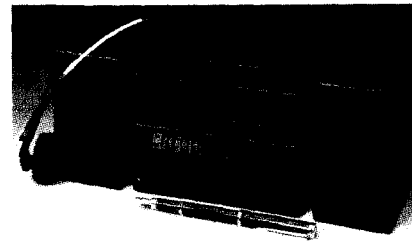

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